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THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION

1924

The Dental Educational Problem—*Gies*

Regulation of Children's Teeth—*Case*

Diet With Reference to the Teeth —*Gurley*

Administration of Nitrous Oxid—*Teter*

Surgical Shock—*Crile*

Dental Nomenclature—*McCall*

Report of Research Commission —*Hetrick*

Some Things of Importance in Orthodontia —*Casto*

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Raising Our Dues

Membership Dues Due January 1, 1924

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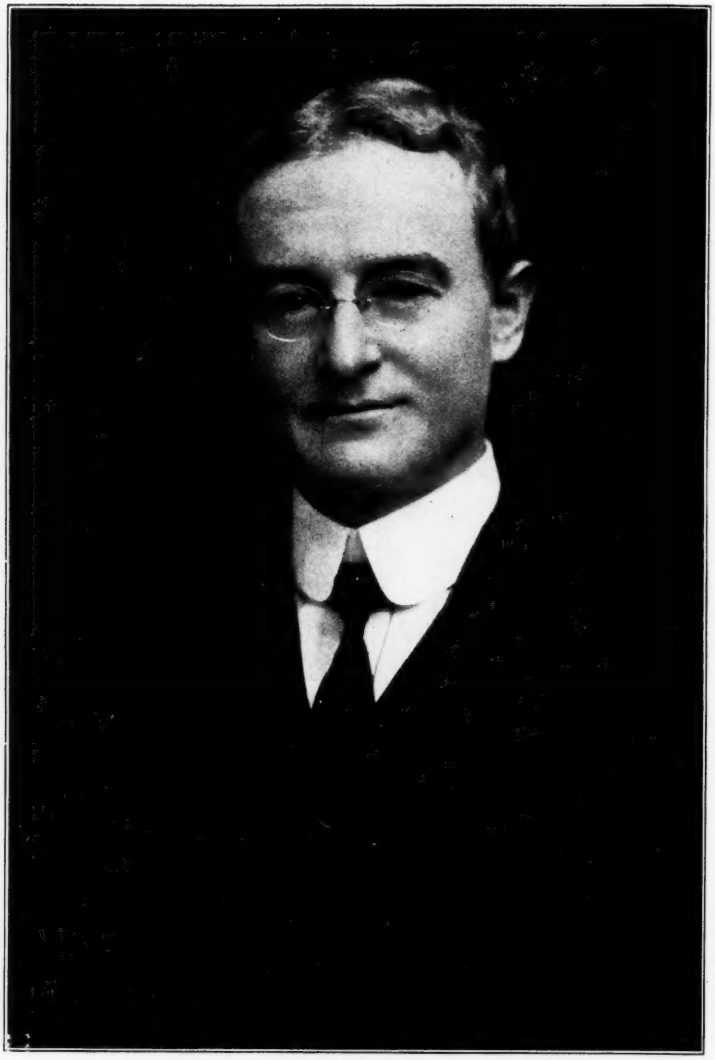

WILLIAM JOHN GIES, M.S., ScD., Ph.D., F.A.C.D.
In charge of the Study of Dental Education of the Carnegie Foundation for the Advancement of Teaching

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Original Communications

THE DENTAL EDUCATIONAL PROBLEM

By WILLIAM J. GIES, F.A.C.D., New York, New York

(Read before the American Dental Association, Cleveland, Ohio, September 10-14, 1923)

WHEN I was invited to cooperate at this annual meeting, I expressed appreciation of the compliment and replied that it would give me pleasure to try to help wherever and however I might be useful. I am here, therefore, not from my own initiative but because I was drafted.

I cordially invite public or private criticism and correction of what I shall say, for my comment will present some of the general conclusions that may soon be published more in detail under very special circumstances. You would do me a favor, and perhaps prevent unnecessary annoyance later for yourselves, if you would point out, here tonight or privately during the next few days, all important errors of judgment and all mistakes of fact that may be detected in this address. If my remarks set you to thinking, and if they initiate reflection and discussion, my immediate objective will have been attained.

Your program committee gave me no opportunity to select a particular phase of the subject. They cheerfully assigned a very difficult task, in general, just as if they supposed I am as good a surgeon as Dr. Crile, and as competent as he to operate on the inoperable[1]. Fortunately for me, although placed in the predicament of facing the "malignancy" of the dental educational problem, I have not lost a surgeon's privilege to "handle the case" in full accord with my own judgment. If I operate for gallstones, although the patient may be suffering from cancer of the stomach, remember that *that* is my privilege, in accordance with surgical custom.

I note the suggestiveness of grouping cancer and the educational problem together as "two of a kind."[1] All who may have wished to flee from the most unpleasant prospects at this annual meeting have been helped to do so. Perhaps, however, the isolation of these two "incurables" here tonight is due primarily to the fact that the prevention of the one, and the solution of the other, are inherently grounded in the deeper and broader foundations of scientific health service.

Please note particularly that my last previous remark referred to foundations of *health service,* and that I did not say foundations of *medicine.* I have been using the term "health service" to signify the whole system of service for the maintenance and restoration of health. This term has the good qualities of self-definition, comprehensiveness and convenience. It has none of the insignia of a banner of partisanship and none of the emotional characters of a war cry. The practice of medicine and the practice of dentistry are coordinate divisions of health service. They are like trees that have sprouted spontaneously from an old stump, the stump having long since disappeared—trees alike in kind and closely similar in appearance, growing somewhat divergently from the same roots in a common soil, through the same air of freedom and individual opportunity, in the same light, toward the sky.

I suggested a moment ago that I have not been denied a surgeon's privilege to "handle the case" in accordance with my own judgment. Your program committee did not ask me to present, at this clinic, a *solution* of the problem. Perhaps it was feared that if I did, I might kill the *patient.* I have not been instructed to suggest any preventive measures affecting it, or any new remedies suitable for its treatment. Perhaps it was feared that, if I did, the patient might kill *me.* I have not even been given a clear case history bearing on the diagnosis. I may evidently do as I prefer, or anything you will permit and to which the patient will submit.

I have been seeking advice, from expert diagnosticians, and as a consequence am suffering somewhat from vertigo. A roentgenogram taken by Dr. Owre indicates, in his judgment, that rickets is "the trouble" and that all that the patient needs is more light—very bright light—and lots of it. Dr. Logan insists that progressive anemia, complicated by aggressive neurasthenia, should not be overlooked in the treatment and that, excepting these disabilities, the patient is "all right." Dr. Friesell suggests, however, that Dr. Owre and Dr. Logan must be wrong in their diagnoses because they cannot be right—they never are—and that, if all the doctors and all the nurses would keep away from the patient, and let him feed himself to suit himself, it would soon be evident that there is nothing the matter with the patient at all, and never has been, except one or two ordinary difficulties of no pathologic significance attending rapid and healthy growth.

With these clear though somewhat divergent views of the situation, I am entirely in accord where I do not disagree. I feel just as certain and just as uncertain about some aspects of the prognosis as each of my diagnostic collaborators. But, you are here in the interest of the patient, the responsibility for immediate action in your presence is mine, and I must proceed with our effort, whether the diagnosis proves to be right or wrong.

I conclude, as a philosophic basis for operative procedure, and as the major premise for my clinical analysis, that our distinguished young patient must be treated in such a way that he will grow normally into full equality with every other person in all the qualities that make a real man. I take it that *that*

1. An allusion to an address by Dr. George W. Crile, on "The Cancer Problem."

is *the* problem—that the means to *that* end, if the means can be found and suitably applied, will put our patient—the dental educational problem—where dentistry belongs: on a plane of full equality in all respects with every other agency in scientific health service for individuals and communities in particular, and for humanity in general.

What, let us inquire, are the indications that dentistry has vitality enough to react favorably to the means that may have to be applied to help it to attain full equality in character, capacity and career with every other important kind of scientific health service?

Have you noted the full significance of the sturdy growth and precocious development of dentistry? Let us go back to early history for a moment, and consider what has occurred.

Eighty-five years ago, in this country, a few practitioners of dentistry saw clearly that health service affecting the teeth deserved special educational attention. When, however, they sought to induce an important faculty of medicine to associate instruction in dentistry with instruction in medicine, that group of physicians said emphatically and intolerantly, no! Despite the presumptive breadth of their knowledge and profundity of their wisdom, these physicians of 1839 lacked medical vision and, worse than that, they were woefully deficient in medical common sense.

The few who saw the vision of better health service in dentistry were devoted and courageous enough to exalt the faith that was in them. The spirit of progress that has been coming down through the ages was firing their thoughts and moving their hearts. Finding that dentistry would be unwelcome in the fellowship of medicine, those men of noble purpose did the best they could to serve—they founded an independent college of dentistry. They gave birth to dentistry as a coordinate division of health service. They put dentistry on the path to independent membership in the group of learned professions.

A few days ago, the same college of dentistry, "the oldest dental school in the world," was welcomed into union with the dental school that is now coordinate with the medical school that could not tolerate, in 1839, the idea of such a professional association. This great historic reversal, at the University of Maryland, is highly significant of the development of a new spirit in health-service education.

The first school of dentistry met an important public need. For nearly thirty years after its foundation, however, the universities "couldn't see" dental education. Nevertheless, and fortunately under such circumstances, independent dental schools rapidly increased in number. It was soon found, by the commercially alert, that independent dental schools could be conducted at a financial profit, just as medical schools were then being managed. Following the example of distinguished practitioners of medicine in all parts of the country, who blazed a golden trail, leading dentists established dental schools that frequently were founded quite as much for the money that could be made *from* them as for the educational and professional service that could be rendered *through* them. In this regard dentistry made the mistake of following the leadership of medicine. Happily for dentistry, however, the degradation of dental education by the selfishness of unworthy commercialism seems never to have been as low or as disgraceful as that of medical education. Fortunately for dental education, again, the reorganization of dental education, in accord with the professional requirements of scientific health service, has been relatively as rapid and sincere as that of medical education.

Perhaps a few in this audience have not learned just what and how much has been going on in this particular relation. Two years ago, by an evolution

that had been in progress for fully fifty years, only fourteen of forty-six dental schools then existing in this country were frankly proprietary in character or were conducted on a plane that was obviously commercial. Of that group of fourteen, *two* have been absorbed by dental schools in universities; *one* has become a *new* integral part of a university; *three* have effected affiliations with universities that are expected to be initial steps to organic union; the owners of *two* are endeavoring seriously and honorably to make the schools integral parts of universities; *four* have been, or are about to be, transferred to boards of trustees of organizations formed to conduct the schools as nonproprietary educational institutions (although the owners preferred, and the new organizations desire, to make these schools parts of universities); *one* has suddenly been replaced by a school of engineering; and *only one*—a grade-C, concern—appears to expect to continue as a proprietary school. In addition, and even more important, mercenary or indifferent management of dental schools, *by some universities,* has been very definitely discouraged, in notable instances has been discontinued, and in all cases will soon certainly disappear.

Accordingly, it may be said, with truth and profound satisfaction, that the era of commercial demoralization of dental education has been quietly but none the less surely coming to a close. The tumor of commercialism has been successfully excised from the body of dental education without any seriously unhappy consequences whatever.

The men who have made these changes in their schools have permitted their professional instincts and their aims in public service to override the promptings of self-interest. It is a pleasure to publicly commend them, individually and collectively, for the honorable way in which these important changes have been effected, and for the sportsmanlike manner in which the owners have accepted the verdicts of progressive professional opinion.

Two years ago the "pre-dental fever" was approaching a crisis. Our patient was very unhappy. Now all signs of deleterious effects of the fever are absent. Recovery has been complete. Two years ago only twenty of the fifty-one dental schools then existing in Canada and the United States required at least one year of college work for admission to the first-year class; and of that number eighteen were requiring it, in 1921, for the first time. Now more than half the whole number of dental schools in Canada and the United States base the study of dentistry on an entrance requirement of at least one year of college work, and the Dental Educational Council has included a pre-dental year of college work among its minimum requirements for a Class-A rating after 1926. Judging from numerous preliminary announcements, practically all the schools of dentistry will require at least one year of college work for admission by 1926, when ten or more, including all of those in the state of New York, will require at least *two* years of preliminary education of college grade. Montreal and Rochester universities have announced a requirement of *three* years of college work for admission to the study of dentistry, beginning in 1925. Montreal will require four years, beginning in 1927.

These developments in dental education closely resemble those in medical education. The features common to the growth of both have been as closely similar as the resemblances often seen between brothers. The further growth of a younger brother may often, though not always, be accurately predicted from that of the older.

There has been signal development of vitality, strength and efficiency, in the body of dental education, from the recent cessation of conflicting and wasteful functions. The administrative and teaching groups have been amalgamated

into a coordinated whole for the support and betterment of dental education in North America. There has been complete elimination of the need, among good fellows, for protection of friends and colleagues in the ownership of private educational property, with all the petty bedevilments that radiated from that personal need. Doubt regarding the desirability of basing the higher aspects of dentistry on preliminary education of college grade has been removed. Realization of the need for thorough training in the medico-dental subjects has become universal. There is growing appreciation by the universities of their duty to regard dentistry as a learned profession and to provide for its fullest and freest development. These important conditions made inevitable the recent establishment of the American Association of Dental Schools, and have provided for that association a broad foundation of opportunity for uncommon usefulness.

The earnest purpose of the new association, and the strength of the educational and professional platform on which it stands, may be judged from the following statement of its objects as given in its constitution:

> The American Association of Dental Schools has been established to facilitate intercourse and conference among *teachers* of the dental sciences and arts in North America; to promote advancement of *teaching* and research in American schools of dentistry; to encourage thorough study and discussion of the needs and problems of dental education; to improve public understanding and appreciation of the quality and value of dentistry; and to maintain dental education in full accord with the highest requirements of professional education in the public service.

The Canadian acceptance of the invitation to amalgamate the Canadian Dental Faculties Association, with three similar bodies in this country, in the American Association of Dental Schools, was not only a sign of the highest degree of professional cordiality but also an act of the most gracious international amity. Historically, it was an outstanding revelation of the fine quality of altruism that animates the leadership in dental education in Canada, and an expression of the confidence of that leadership in the good will and professional integrity of their colleagues in the United States. I hail the generous cooperation of the Canadians, and our delight to have it, as signs of a new bond of fraternity between their people and ours, and as another of the many lines of attachment between us that will hold both nations together permanently in warm friendship and in mutual trust, respect and esteem.

The Canadian universities are among the best in the world—and every Canadian dental school is a part of, or closely affiliated with, a university.

A university represents, as a rule, the best type of public agency for the promotion of advanced education in all its branches. The management of the university, as a rule, is competent and altruistic. The university is trusted by the people to promote the public welfare as against the private or personal interests of its managers and officers. Accordingly, the university receives gifts and acquires cumulatively a permanent endowment in support of the functions it performs, and is *expected* to perform, generously for the benefit of the public.

Independent professional schools, if proprietary, cannot for obvious reasons, expect to receive endowments. Independent schools that are nonproprietary rarely obtain endowments because the public senses their scholastic disability, from lack of academic associations, and not only refuses to believe that they *can* be as useful as they would be if they were parts of universities, but also and for that reason declines to help them financially. This tendency has been growing rapidly everywhere.

The School of Dentistry of the Royal College of Dental Surgeons of Ontario is an exception that proves the rule, although in a sense it accords with the rule, for that school is conducted by the whole dental profession of Ontario in the

spirit *of* a university and in close affiliation *with* a university.

These facts indicate why, all other things being equal, there is advantage to dentistry from general incorporation of the dental schools into universities. The university will be trusted to give to each of its parts a proper share of gifts and receipts from endowments; and because of the university's altruistic relation to the public, the university may expect to receive, and can suitably invite, endowments for such specific purposes as the promotion of dental education. If, however, a university uses a dental school as one might use a cow—to provide food for all the members of the family—then membership in a university may be detrimental rather than helpful to the work of a particular group of dental teachers. Nothing whatever can be said in behalf of such university management, from the point of view of promotion of dental education.

There has been considerable misapprehension on the latter point among university presidents and trustees. They have been led to believe, by dentists, I regret to say, that a dental school can be properly conducted not only on a basis of financial self-support but even as a money-maker for the whole university. Much maladministration of university dental schools has resulted from promotion of this erroneous idea, and also from suppression of the whole truth in this relation.

I have lost no opportunity lately to rectify the gross error that has been made in this connection. Dental education deserves and should receive specific endowments for its promotion. It should receive a full share of all the advantages that now accrue to the teachers, investigators and practitioners of every other type of scientific health service. The universities owe it to the public, to dentistry and to themselves to make this situation perfectly clear to all concerned, so that the spirit of philanthropy may be induced to give to dental education the support and encouragement that the fullest growth and greatest perfection of dentistry require.

The prospect of early rectification of this situation is very bright, because of the awakening now in progress in the universities all over the country.

In this relation a few statistical items may interest you. The number of *independent* dental schools in the United States has dwindled, since 1921, from fourteen to seven. Of the forty-three dental schools now existing in the United States, thirty-four are parts of universities and two are parts of associations of professional schools. Of the thirty-six schools in these two groups, all but three are parts of institutions that contain undergraduate schools of medicine, with which the dental schools are, or could be, effectively coordinated. Each of the five Canadian dental schools is a part of, or is closely affiliated with, a university containing a school of medicine.

If now I revert again, in figurative language, to our patient, whose "case history" we have been following in general terms, it may be said that outstanding evidence of the vitality of our patient, and of his capacity to surmount new difficulties, is the fact of his rapid and steady growth from infancy. Very recent indications of that vitality are his complete recovery from the successful operation for the removal of commercialism; complete recovery from the "predental fever;" complete recovery from perversions of the functions of some of the *internal secretory* glands; effective scholastic competition with other agents in scientific health service, and his growing acceptance in important circles where good health and achievement in public service are prerequisites for admission.

Discussion often causes confusion when there is lack of agreement on the meaning of the terms employed, or on the definitions involved. Are we agreed in our views of dentistry's character, duties and opportunities?

The *lay* public expects dentists to be intellectually, morally and professionally the peers of all who are engaged in scientific health service. The lay public expects dentists to be competent to render personal health service in a thoroughly modern and practical manner, and primarily for the welfare of the patient. It knows little of scientific requirements, and is often unable to tell the difference between very good service and very bad service. It is completely at the mercy of its health servants. But the lay public is rapidly informing itself about the full significance of the hurried attention, in brief appointments, to localized tasks without concern for correlated conditions of distress, and with "next-next" accelerations of doleful processions through the offices of many machine-like practitioners.

The *educational* public, which is a relatively large and alert portion of the lay public, readily detects signs of intellectual and cultural inferiority. It knows that the modern opportunities for health service cannot be met fully by anyone who lacks the degree of professional education or experience that is necessary for an understanding of the *scientific* requirements of such service.

Physicians and surgeons know that dentistry has not been basing its craftsmanship as solidly on the medico-dental sciences as competency to cope with the processes and variations of dental and oral pathology requires. Leading physicians and surgeons find it difficult or impossible to cooperate effectively with, or professionally to trust, those who cannot talk the language of general health service and who do not think in terms of that language.

Investigators in the biologic sciences (their number is rapidly increasing everywhere) are particularly competent to detect the wholly superficial, unverified, and often absurd views on which the biologic aspects of certain features of dental practice have been based empirically; and such men, astonished at the general indifference to research in the *biologic* aspects of dentistry, justly doubt the efficiency and desirability of much that is done in the name of dentistry.[2]

Dentists who have had the advantages of training not only in dentistry but also in medicine deplore the multitude of errors in the pathologic judgment of those whose training has been mainly in dental mechanics and whose vision of dentistry has been kept almost wholly within the narrow confines of such limited training.

Most significant of all: such valiant champions of dentistry, and of its highest aspirations for successful health service as Dr. Kells, careful clinician, cautious, conservative and conscientious critic as he is, speak as follows, as did Dr. Kells recently (in part) on the important public occasion of his recipiency of one of the distinguished honors in dentistry.[3]

> I believe I have been a rather close observer, and I have had, during forty-five years of a rather full practice, ample opportunity for observation, and I have never yet seen an alveolar abscess that was not directly caused by either a dead pulp or pyorrhea.
>
> Thousands of dentists the world over, basing their opinions upon countless thousands of *apparently* successful treatments of infected root canals, boldly proclaim that by proper treatment, some infected teeth can be freed from infection.
>
> Unfortunately, probably not a single one of these thousands of dentists is in a position to prove his work. That part of it is absolutely without the province of any practicing dentist, and can only be done in a clinic of some kind.
>
> Friends, this is generally conceded to be the "age of science." Dentistry is a science, but no science can progress without the deepest kind of scientific study and research work. . . . . .
>
> Is it too much to hope that the day will come when dental research work will occupy as prominent a field as medical research

2. The paragraph might be repeated, with equal fidelity to truth in another important relation, with the word *engineering* substituted throughout for *biologic*.

3. Kells: Proceedings of the Dental Society of the State of New York, May, 1923; Dental Cosmos, 65:1072 (Oct.) 1923.

work? As a matter of fact, should they not keep pace with one another? Five years of such intensive study would put dentistry upon a different plane in the scientific world.

On January 31, 1913, Dr. Charles H. Mayo delivered an epochal address before the Chicago Dental Society, in which he made the now historic statement: "The next great step in medical progress in the line of preventive medicine should be made by dentists. The question is, will they do it?"

Ten long years have passed since that memorable occasion, during which time dentistry has striven its best to answer Dr. Mayo's question in the affirmative, and here, tonight, I do not hesitate to say that, notwithstanding all of its efforts, it has thus far signally failed to do what was hoped of it. . . . . .

I am confident that every one in this room loves his profession. I am confident that each and every one wants to see the science of dentistry continue to advance. I am sure that all of us realize the handicaps under which our science is laboring.

In my own enthusiasm for dentistry as one of the most useful forms of scientific health service, I may be expecting too much of it, but this, in general, is what it seems to me that it is; or ought to be, if it is not; or will be very soon, if it is not now:

Dentistry is the learned profession that is devoted

(a) to esablishment of the principles, and to application of *all forms* of scientific health service relating *directly* to the teeth and adjacent oral parts, and also relating *indirectly*, through such service, to the welfare of other parts and of the body in general.

Dentistry also includes

(b) establishment of the principles of correlation between dental and oral conditions and systemic diseases. It includes the detection and *provisional* diagnosis of dental and oral symptoms that indicate or imply the prevalence of ill-health elsewhere in the body. It includes an *advisory* health service for the patient based on such a diagnosis.

If it should be suggested that the term "dentistry" refers logically to teeth only, and that a word like stomatology would be more acceptable for what I have defined as dentistry, I would reply that the word "dentistry," like many others, has acquired meanings from usage and from convenience that transcend all other considerations, and should be retained as long as the conveniences of usage make it acceptable.

If the definition I have given is a sound one, the work of the dental hygienist is one of the simplest expressions of dentistry. The definition comprehends the whole of major oral surgery, one of the most complex expressions of dentistry. If this definition is not illogical, then the entirety of dentistry is coordinate with every important division of health service; is a part of the *whole* of health service, regardless of traditions, partisanship, or prepossessions; and must be grounded ethically and educationally as solidly and as broadly as every other important division of health service.

If my definition is valid—and I believe it is a comprehensive expression of a proper professional view of the full content of modern dentistry—certain obvious truths flow from that definition, among them the following:

It is a function of research *in dental schools* to establish and to coordinate (a) the principles of modern dental and oral health service, and (b) the principles of the collateral *advisory* health service that may be properly performed by dentists.

It is a function *of dental schools* to teach the principles of, and to afford training in, the application of the principles to, (a) modern dental and oral health service, and (b) such collateral *advisory* health service as may be suitably rendered by dentists.

A responsible dentist should be a competent diagnostician of all dental and oral disorders. He should be versed in the knowledge of the relations of all

dental and oral conditions to systemic disorders.

A responsible dentist should be a master of accumulated knowledge pertaining to the symptoms of systemic disease that may appear in the mouth. He should be competent to apply this knowledge to promotion of the welfare of his patients. He should perform the collateral *advisory* health service of giving suitable *guidance* to the patient, in full realization of his whole professional duty to every one in his care.

It is obvious, of course, that all the great excellences of traditional dentistry, and its achievements in prevention, treatment, cure, extraction, restoration, substitution, adjustment, readjustment, etc., are included in the scope of the definition of dentistry I have proposed. It is equally obvious that the definition implies that, in teaching the mind of the dentist to think, his hands must also be trained most effectively to do.

Our *problem*—the subject of this address—does not include any difficulty regarding continuance and perfection of training in the mechanical arts of dentistry. This is essential. Here agreement is unanimous. *It would be a waste of your time to go into this phase of the subject.* Nothing seems more certain—and in the name of humanity I wish it were not—than the inevitability, for many years to come, of widespread continuance of dental and oral diseases, and of the necessity for corresponding removals, and for mechanical substitutions and artificial restorations. I believe they are about as inevitable for civilized man as death itself; and that evolutionary forces involving, among other effects, ultimate complete loss of the third molar, are not the least of the influences that will mock our efforts to gain complete, or even relatively complete, preventive control.

Let no one misunderstand my position to mean proposed subtraction from dentistry of any good quality it now possesses, or of any useful service it now performs. My remarks allude chiefly to *additions* to its distinguishing qualities and to *extensions* of its avowed service, with all the most important phases of it on a broader foundation of learning and on a higher plane of understanding than now. Our problem does not include any question of continuance of thorough training in the mechanical arts of dentistry—it relates rather to the question whether the function of dentistry should be expanded, and whether additional and modified training, in accord with the requirements of the expanded function, should be included in what we conveniently call dental education.[4]

At the risk of tiring you by repetition, but with a purpose, by recapitulation, to prevent misunderstanding, permit me to urge that the primary need, in dental education as a system, at the present stage of its evolution, is its early and orderly placement on a basis of scholastic *equality*[5] with what is now called "medicine," both in the character and scope of the preliminary study required, and in the depth of the scientific foundation afforded. Dentists and physicians should be able to cooperate intimately and effectively—they should stand on a plane of intellectual equality and should be able to "talk the same language." The dentist should obviously be educated

4. In this address I have aimed to give attention, in constructive criticism, to some *debatable* aspects of the subject under discussion. I have not referred to the need for improvement of dentistry from the standpoint of the science and art of engineering, for example, because this need is among those that are self-evident. Dentistry, in its entirety, should be as much a *blend* of biology and engineering as biologic chemistry is a *blend* of biology and chemistry. In biologic chemistry, chemical means (*with others*) are used to attain biologic ends. In dentistry, engineering agencies (*with others*) are used to secure health-service benefits, to say nothing of "comfort and cosmetics."

5. The reader is cautioned to distinguish carefully between the proposed "scholastic *equality*" and an assumed scholastic *identity*. The latter has not been suggested.

to study his problems with a *medical mind* and trained to perform his special service with *medical understanding*.[6] He should be equal to the physician in the quality of his service as a guardian of the health of individuals and of communities. His localized dental and oral service should be rendered with full comprehension of the general relation of that service to the welfare of the body as a whole, as well as to the individual bodily parts directly involved or immediately adjacent. He should comprehend the meaning of the oral signs of systemic disease and should give *advisory* health service accordingly.

Dentistry can no longer be accepted as mere tooth technology. Its function, including all that, has risen to the dignity of scientific health service. The developments of medical knowledge in general, and of dental science in particular, have made it obvious that the dentist should have the understanding and capacity of a physician in all the requirements of successful prevention, diagnosis, treatment and cure of disease, as well as the skill and efficiency of the surgeon in the mechanical arts of adjustment, removal, substitution and restoration. Trained technicians and assistants will always be needed for useful service in cooperation with dentists, physicians and sanitarians in general, and for the performance of the simpler mechanical tasks of dental art, including laboratory work. If and when the supply of such assistants falls below the demand for them, the need for them can be appropriately met by special measures. What humanity now requires most of all of "dental education" is an increasingly larger number of men and women who will practice *and develop* the wider reaches of dentistry with the advantages of an advanced preliminary education, with knowledge and judgment acquired on a solid foundation of study of the medico-dental sciences, and with the capacity and skill derived from a thorough practical training in the arts of diagnosis, prevention, cure and treatment of dental and oral disorders, with due regard for their systemic sequellae and their systemic correlations. There is a growing need, in short, for dentists who will be not only dental *engineers* and dental *surgeons*, but also dental *physicians* and dental *sanitarians*.

I have not suggested a belief that all dentists should be expected to attend to the same details of health service or to receive entirely the same training. Specialization within the dental division of health service is inevitable and desirable, as in each of the other divisions. The creation of the dental hygienist is an illustration of the trend of the times in the establishment of accredited subordinate service within the scope of dentistry, and under the supervision of responsible dentists.

I would not be surprised if I were told that many in this audience earnestly *believe* and *fear* that the proposed elevation of the educational requirements for admission to the study of the *most important phases of dentistry* would reduce the number of practicing dentists below that required to give all the people everywhere all the dental health service they desire or need, or both. I should be glad to discuss this subject in full detail, privately, with any who seriously fear this result as a consequence of the *gradual* and *reasonable* elevation of educational standards. For the present it may suffice to ask a few direct questions in imaginary reply, on the assumption that the hypothetical belief or fear can be considered, in this way, in terms that will not involve further doubt and which cannot be misunderstood.

Do dentists, after graduation, prefer to establish their practices in towns of, say,

6. Equality of health *understanding*, not identity of medical *information*, is suggested. A good laryngologist has "medical understanding" but he may be "lost" in the details of proctology. It has not been suggested that the dentist is the *one* kind of health-service agent who should be educated to be omniscient.

1,000 population or less? Do they prefer to live in towns that are removed as far as possible from cities, and where the economic and social conditions are uninviting, but where there are special openings for health service that is urgently needed but will be poorly recompensed? Or, do dentists, like physicians, prefer just the opposite: to go to the larger centers of population, where conditions are prospectively more promising for the practitioner himself as a person—and despite the fact that the opportunity for personal health service may not be so great, there, as it would be in a village, because a large number of practitioners are already on the ground in the larger centers?

If twice as many dentists should be graduated in 1924 as were graduated last spring, what proportion of the extra output would probably open offices in towns of, say, 1,000 population or less where there are now no dentists? How many dentists would have to be graduated, next spring, let us say, to "drive" at least one dentist into every village in the United States? Would graduation of even a million do it? Would excessive "competition," from an overabundant supply of dentists, "drive" the surplus number of dentists into the villages, *or out of dentistry?* What would the overcrowding of the cities, by dentists under conditions of undesirable competition there, do to the morale of dentists and to the character of dentistry?

What conditions determine the distribution of practitioners of dentistry? Is opportunity for the largest possible degree of humanitarian service, *without regard for the prospective economic advancement and social contentment of the practitioner himself,* the main determining condition?

If I were to start an unlimited supply of water running from a spigot on this platform, would the water spread out uniformly over the floor, as I might desire or predict, or would it run along lines of least resistance as gravitation might determine?

In this relation I feel impelled to say that it is a matter of very great regret to earnest students of the technology of professional education that the degrees of *Doctor* of Medicine and *Doctor* of Dental Surgery were ever conferred as symbols of the completion of undergraduate courses in medicine and dentistry. The degrees of *Bachelor* of Medicine and *Bachelor* of Dental Surgery would have served every useful *public* purpose as well or better. Bachelor degrees in medicine and dentistry would have been academically analogous to other bachelor degrees, and their award would not have implied the acquisition of *advanced professional* knowledge and training for which the doctorate degrees in medicine and dentistry, as they have been bestowed, have been and are relatively false symbols.

If the degrees of *Bachelor* of Medicine and *Bachelor* of Dental Surgery had been regarded as academic signs of ability safely and sanely to *begin* the practice of the corresponding *arts,* two higher degrees of conventional usage—Master and Doctor—could have been effectively employed to signalize successive stages of further advancement in knowledge, training, experience and wisdom. The degrees of Master of Dental Surgery and Doctor of Dental Surgery could have been used by the dental schools as proper incentives to further intellectual and professional effort on the part of practitioners, and would now be helpful publicly to distinguish completion of various stages of advanced study and training, in dentistry, to the highest possible satisfaction of the dental profession and of the public. A *bachelor* degree might now be made the symbol of a training that would meet the *minimum* legal requirements for the *beginning* of practice.

I shall propose and am hopeful that leaders in the various divisions of education for health service will include this important subject among the many that

should engage their earnest attention, *in the reorientation and recoordination of all phases of health-service education that are now in order and will soon require general consideration.* Present custom has been frozen into a rigid system by the state laws. General discussion and agreement, and concerted action based on agreement, are prerequisites for any general improvement in this direction.

I call your very special attention to the fact that, if the proposed widening and deepening of the foundations of dental health service should be achieved, when the time is ripe for such attainment, dentistry would then be, in fact, the peer of medicine, would be so regarded *by* medicine, and would be accepted *as such* by every other health-service agency and *also by the public at large.* You and I know that there is "something wrong somewhere," at present. Let me turn a flashlight on a particular spot. How often has dentistry "figured" in any of the important annual medical and public health congresses? What was its share in the important annual Public Health Congress in Chicago last March? Why was dentistry completely ignored there? Did you know that dentistry was entirely "out of it" at that congress? It certainly should not have been, but it was, although I believe for the last time.

The congress continued for three days. The *general* subjects on the program were medical education, medical examinations and licensure, hospital service, organization of the public for cooperation with the medical profession, and public health. An entire afternoon was devoted to the latter subject—*public health!* Not a single dental paper on the long three-day program. Not a single dentist named on any part of the program. Think of it! Think of it! I wish I could "ring a bell on it" so loudly that the "racket" would be heard by every living dentist.

You are the attorneys in dental health service for all the people. They are your clients. You owe it to them, and you owe it to yourselves as their trusted servants, to advise them what they should do to obtain the best dental health service when they need it. You owe it to them and to yourselves to show them persuasively how they can and should help to support the promotion of dental health service everywhere and the system of education on which such service must be based.

I speak, tonight, not only as a professor of dental science—and therefore as one of you, in spite of any objection you may have to the accident—but I speak also as a layman. Representing, and speaking for, the great body of people, practically all of whom need your service frequently, I publicly note the fact, here and now, that we have been looking you over. We see right through you. We like you. You are earnest, efficient and faithful. You are progressive. You are modest enough to believe you can do better. You will never be satisfied with any stage of progress that does not put your health service as high *in quality* as any other. You will "go the limit," if the public will endow your schools and multiply the agencies through which you can render better and enlarging public health service.

I have sought, in this address, to stimulate reflection and to excite discussion. Of the many phases of the general problem of dental education, only a few were selected for this purpose.

THE EARLY REGULATION OF CHILDREN'S TEETH

By CALVIN S. CASE*, M.D., D.D.S., Chicago, Illinois

(Read before the American Dental Association, Cleveland, Ohio, September 10-14, 1923)

IN regard to the early regulation of children's teeth, everyone should agree that conditions frequently arise during secondary dentition when it is very important that Nature should be aided in her wonderful work of dentition, particularly in cases which are due to premature loss of deciduous teeth, thereby permitting the adjoining erupting permanent teeth to drift into and to occupy the places of the succeeding teeth. These spaces should be opened with the most delicate apparatus that will restore and retain them until the retarded or impacted teeth have at least partially taken their positions.

With few exceptions, I never begin the early regulation of children's teeth much before the eruption of the second molars—for one reason, you have them on your hands, or rather they have you on their hands during the time of life when they should be running free; whereas, there is no case in orthodontia, however dentally or facially deformed, which cannot be corrected with greater assurance of success, and often with far less difficulty, if you wait until after the eruption of the second permanent molars. This has been proved in hundreds of cases in my practice.

But that is only a part of the story. For the last several years, orthodontic societies and sections of the American Dental Association, and their journals, have been teeming with society papers and articles advocating the very early—so-called "preventive"—regulation of children's teeth.

A few months ago a friend sat down beside me at the Chicago Athletic Club and asked, "Do you know Dr. .....?" naming a prominent orthodontist in one of our suburban towns. I said, "Oh, yes, he is one of my very valued friends." After telling me that this orthodontist had been looking after the regulation of his little children's teeth for the past few years, he said, "He must be a very advanced orthodontist; he separates the baby teeth in time so that the permanent teeth will not come in out of place." Then he turned to me and said, "I suppose you practice that, do you not?" And when I said "No," he gave me a look of surprise as much as to say, "Well you *are* a back number."

A few years ago a mother, for whom I had regulated teeth when she was a child, came into my office quite excited, bringing her own little girl, between 5 and 6 years of age, and told me that she had been informed through her friend's orthodontist that if she did not commence to have the baby arches expanded immediately by separating the baby teeth, the permanent teeth would be irregular. She remembered how her own teeth had started to come in that way, and how I told her parents to let them alone, with the result that the irregular teeth, which in this case pertained principally to the lower front teeth, finally adjusted themselves, with-

*Dr. Case died April 16, 1923. This paper was read at the Cleveland meeting by Dr. H. J. Goslee.

out aid, evenly in line. Later, this case developed a decided dento-facial protrusion, which was easily corrected and retained in my way after the eruption of the second molars.

But why multiply examples? I wish to call your attention to certain broad principles which I hope will give you a different viewpoint.

What has Nature been doing unaided the past two or three hundred thousand years since man, as *homo sapiens* has been occupying the earth? And also during the millions of years before that, while our wonderful masticatory apparatus was developing, and which now, still unaided by modern orthodontists, has brought about that beautiful result we are pleased to term "normal occlusion."

Here is another side to the subject. Within the past years, either through the forces of the law of natural variation, or the growing tendency toward inharmonious sexual unions, with their many influences, in which Mendel's law has played no unimportant part, there has arisen a variety of malocclusions—with quite as fixed sources of heredity as they would have possessed if from direct heredity—representing bimaxillary protrusions, and all the malocclusions of Classes II and III. Of course, it is not claimed that all cases of this kind arise from heredity, but there is no doubt that a large proportion of them do.

Within these two classes arise all the mal-antero-posterior malrelations of the dentures, nearly all of which must arise from heredity. During the past years of orthodontia, there has been a growing belief that these cases should be corrected by shifting the dentures to normal occlusion—commencing as early as the eruption of the first molars, though they can be easily corrected at any age. At the meeting of the American Society of Orthodontists in 1920, I presented a paper which gave a history of my own experience in attempts to correct these cases by shifting the dentures to normal occlusion, commencing with cases as early as 1892-3, all of which were easily corrected in that way, but all of which finally responded to the call of heredity and went back to their former malpositions.

In my teaching I have endeavored to point out principles which I believe will bring better results in the correction of these characters and in the processes of which the buccal teeth are not materially disturbed. While it may be a way which does not lend itself to the requirements of an idealistic occlusion, it *is* one which can be permanently retained, and if the treatment is based on correct dentofacial diagnosis, and followed with the proper application of forces and retention, it will bring a lasting satisfaction, possessing all the requirements of a healthful mastication. These rules are fully outlined in my textbook.

Therefore, if one shifts the first permanent molars, as soon as erupted, to normal relations, with the view of forcing a normal occlusion of the dentures, do not imagine that that alone will force the developing processes to assume the production of an Apollo-like form, "as God intended it should be," as in all probability if it stays—which is doubtful—you may be forcing on the child a bimaxillary protrusion, which in a moderate state is one of the common causes of homeliness, and produces a far more unattractive face, even, than pronounced retrusions of lower dentures in relation to mandibles. Why not wait for such changes until later, when you know far more of the inherited strains of the individual, as they rarely assume permanent proportions before the beginning of adolescence?

Why hunt around for visionary influences like someone's conception of the powers of an idealistic occlusion of the teeth, or the pituitary body and other fallacies, when so many simple, well-trodden paths lie plainly before you which are founded on substantial things?

It is only a very small percentage of

children for whom we ever have an opportunity to regulate teeth, probably not one-half of 1 per cent whose parents are able or inclined to have their children's teeth regulated. Moreover, with rare exceptions, it is only within the past few years that anyone ever thought of the regulation of very young children's teeth, say from 5 to 8 years of age; and you need to go only a little farther back to make the same statement in regard to adults. Do not forget the hundreds of thousands of years during which the forces of evolution alone, unaided by man, through the laws of heredity, natural selection, and adaptation, have persistently reproduced those beautiful normal anatomic occlusions, which is the common occlusion of the human race, and, too, even in countries like America that are the most liable to physically disharmonious unions through the admixture of races.

I want to ask you to think of these things deeply from a broad view, and ask yourselves if it is not presumptuous on our part to tamper with Nature's ways in all cases where we are not absolutely certain that she is not performing or cannot perform her amazingly wonderful work of secondary dentition in the same way that she has been allowed to work for the past untold millions of years on millions of peoples.

I make this appeal for the sake of the little ones whose minds and bodies should be allowed to grow and develop naturally, unhampered by the irritating influences of more or less painful regulating appliances, which in nine cases out of ten may be and are absolutely unnecessary and uncalled for. I make this appeal especially to those sections where there is this mad rush to appease a popular sentiment and where there is a strong endeavor to force a very questionable and dangerous teaching, and particularly to my friends, the younger orthodontists, who naturally grasp with avidity the opportunity to increase their clientele, with its financial benefits.

CASE MEMORIAL SERVICE

(Read before the American Dental Association, Cleveland, Ohio, September 10-14, 1923)

We are assembled here to pay tribute to one who, had his life been preserved, would have occupied this hour to present a paper on an orthodontic subject. Although Dr. Case was ill when I last corresponded with him relative to his attending this meeting, he assured me that it was his earnest desire to be present, and stated that he had prepared his paper.

It has seemed to the officers of the section that this would be a most suitable hour in which to show our respect for Dr. Case, whom we all knew so well and loved.—Clyde M. Gearhart, Chairman of the Section on Orthodontia.

Calvin S. Case, The Teacher

By J. P. Buckley, Ph.G., D.D.S., F.A.C.D., Los Angeles, California

I have been asked to write a short article on Calvin S. Case, the teacher, and as Dr. Case was both my teacher and my friend, the task assigned should not be difficult.

In the teaching process there are certain universal factors which must be recognized and used in the effort to impart knowledge in such a manner as to prove of the highest value. In his every effort the teacher should be conscious of the experience produced in terms of the development of the student; he should leave the student with a lifelong

tendency to seek the truth. This can be accomplished only by adopting and following a universal method in the teaching process. Method in teaching has been defined as the way, the process, the movement, by which some end set up is realized. The teacher forms an ideal of the results to be attained, then the process, or method, of realizing the ideal claims his attention. Dr. Calvin S. Case was one of the most methodical teachers of my acquaintance. When he entered the classroom it would be noticed at once that his subject-matter was well in hand, and the method of imparting knowledge was clear and definite. With him as the teacher there was never a sigh of relief when the hour was over; but, on the contrary, each student was left with the full significance of the subject and with that longing desire for more knowledge.

Dr. Case's charming and pleasing personality stood him well as a teacher. His unusual ability to draw on the blackboard the thing he had in mind and which he desired the student to receive was a characteristic trait; and especially was this of value to the teacher in those days when the lantern and the slide were not so conveniently at hand. An evidence of Dr. Case's ability as a free-hand artist is found in his book on "Dental Orthopedia" wherein, by his own hand with a pen, he has drawn out the working details of appliances and apparatus for all forms of irregularities of the teeth. The character of the man as a teacher is reflected in the dedication of the book: "To my friends and all who are interested in the highest possibilities of dental orthopedia."

Few men in our profession have attained the success in a specialty that was reached by Dr. Case, and his ability to teach that specialty to others was recognized wherever dentistry was practiced. In his passing the world has lost a man of the highest character; dentistry has lost one of its greatest and most willing teachers, and I, personally, have lost one of my dearest and best friends. What more can I say?

Calvin S. Case, The Author

By Otto U. King, D.D.S., F.A.C.D., Chicago, Illinois

"I shot an arrow into the air,
It fell to earth, I knew not where;
For so swiftly it flew, the sight
Could not follow it in its flight.

"I breathed a song into the air,
It fell to earth, I knew not where;
For who has sight so keen and strong,
That it can follow the flight of song?

"Long, long afterward, in an oak
I found the arrow, still unbroke;
And the song, from begining to end,
I found again in the heart of a friend."

It was on September 5, 1921, that Dr. Case presented me with a copy of the second edition of his book "Dental Orthopedia and Prosthetic Correction of Cleft Palate." This book was autographed with the beautiful sentiment "To Dr. Otto U. King this book is presented with love and the sincerest regards from the author."

Dr. Case was rich in real friends. This was due to his having sown abundantly, during his life, of sympathy, interest, admiration, helpfulness and love. He had a large number of very intimate friends who loved him as a brother.

The Miracle of Friendship

When Montaigne wrote his essay on friendship, he could do little but tell the story of his friend. The essay continually reverts to this with joy that he had been privileged to have such a friend, with sorrow at his loss. It is a chapter of his heart. He could not account for it. It was a miracle, but it happened.

The joy that comes from a true communion of heart with another is perhaps one of the purest and greatest in the world, but its function is not exhausted by merely giving pleasure. Though we may not be conscious of it, there is a deeper purpose in it, an edu-

cation in the highest arts of living. We may be enticed by the pleasure it affords, but its greatest good is got by the way. Even intellectually it means the opening of a door into the mystery of life. Only love understands, after all. It gives insight. We cannot truly know anything without sympathy, without getting out of self and entering into others.

Dr. Case's interest and love for others is aptly illustrated in the fine sentiment which predominated in the banquet he gave to Dr. Goslee and a few of their mutual friends on August 5, 1920, and a similar dinner Drs. Case and Goslee gave to Dr. Buckley in Chicago, November 5, 1920.

Anyone who was privileged to attend either of these unusual dinners was deeply impressed with the spirit of brotherhood which prevailed throughout the evening. I have visualized these occasions many times and in doing so there has come back to me the poem of Douglas Malloch which was presented by one of the speakers. This poem symbolizes in an unusual way Dr. Case's love for his fellow-men.

"The love of a woman is sweet;
In life I have fondled a few,
Have felt the red blood as it beat
The uttermost arteries through.
Yet God in His wisdom divine,
Yet God in His infinite plan,
Made nothing as holy and fine
As the love of a man for a man.

"He'll go with you over the trail,
The trail that is lonesome and long;
His faith will not falter not fail,
Nor falter the lilt of his song.
He knows both your soul and your sins,
And does not too carefully scan.
The highway to Heaven begins
With the love of a man for a man."

The Chicago Dental Society, on January 25, 1919, gave a testimonial banquet to Dr. Case. I had the honor of presenting one of the addresses from which I take the following quotation:

"I have given special study to the history of dentistry. It does one good to step back and get a perspective of the men who have made dentistry from the time of Hypocrates to the present time. History is written from the perspective. A man has to die in order that the complete measure of his life-work may be calmly viewed and taken. It is then that the trifles and the unimportant points lose and give way to bolder outlines of character. It is then that the rugged features that made his life dominant stay and stick, as it were, on the horizon of history, clear-cut marks.

"In stepping back and getting a perspective view of the life-work of Dr. Case, we can see the man with the motto of 'Thoroughness to the Finish' written in all his work; we see a man who was not afraid to advance the cause of dentistry. His work on orthodontia and cleft palate will ever stand out as a monument—advancing the cause of dentistry."

Poise and dignity and graciousness supplied the elements from which his character was compounded, and loftiness of spirit was the result.

It is worth while to study the lives of the great masters, to learn of the principles underlying their success in their special field.

Don't fool yourself into believing that the "great masters are fakers." It was not by any sort of electioneering, jacking up, nor managing that Bacon, Plato and Emerson were elected to their special positions as thought rulers.

Beethoven, Mendelssohn and Wagner rose as the stars rise. No pushing helped them. No hampering hindered them. When you come to the genuinely great men and things that the world brings down to you, you are in the presence of actual cosmic forces.

Gray matter is what makes the man—the amount of brains he has, and the quality, and the way in which the gray matter works.

In one of the laboratories of Washington they have a great round glass that measures 3 feet across. It is like the burning glass we used to treasure when we were boys, only much larger.

This great glass gathers the rays of the sun that strike its flat surface and focuses them on a single point in a space a few feet below. That single spot is hotter than a blow torch.

This terrible heat—it cannot be measured, for it melts all instruments—is just 3 feet of ordinary sunshine, concentrated on a single point. Scattered, these rays are hardly felt—perhaps just pleasantly warm; concentrated, they melt adamant.

The same principle applies to human endeavor. Scattered, a man's energies do not amount to much; once they are all focused on the task in hand, seemingly tremendous difficulties are overcome, as snow is melted on a hot stove. Dr. Case, early in his professional career, learned the real secret of great achievement.

It was in 1894 while attending the Chicago College of Dental Surgery that I first met Dr. Case. I could see in his very expression, in his masterly bearing, in the superior way in which he was doing things, in his victorious attitude, that he was a great man in dentistry and destined to rank in the same class with Kingsley and others who have done real pioneer work in our profession. His manner, his conversation, his energy, his enthusiasm for dentistry and his high ideals were signposts which indicated that his ambition would be achieved. No matter what the conditions, whether favorable or unfavorable, Dr. Case always manifested an onward aspiration which no one who pretends to interpret life could mistake.

Dr. Case possessed staying power, which is the final test of ability. The real caliber of a man is measured by the amount of opposition that it would take to down him. The world measures a man largely by his breaking-down point. Where does he give up? How much punishment can he stand? How long can he take his medicine without running up the white flag? How much resisting power is there in him? What does the man do after he has been knocked down? This is the test. Our friend stood this acid test.

Dr. Case was author of "Facial and Oral Deformities" and "Development of Esthetic Facial Contours" in the American Textbook of Operative Dentistry. He also published two editions of the "Dental Orthopedia and Correction of Cleft Palate."

From dental literature we are listing the following contributions which he has made to dentistry:

Writings of Calvin S. Case

Results obtained in Two Otherwise Hopeless Surgical Cases Through the Action of Orthopedic Force Upon Cicatrical Tissue. *Review,* XXV, 1911, 317-327, 8 illus.

The Question of Extraction in Orthodontia. *Cosmos,* LIV, 1912, 137-157, 25 illus.; 276-284. Disc. 331-354, 35 illus. Answer 1006-1008. Reply 1337-1338. Answer to Dr. Ferris, LV, 54-55.

Principles in Orthodontia. *Items,* XXXV, 1913, 892-898.

Toast at First Dist. Den. Soc. Banquet. Scrap Book VI, Feb., 1913, 1921.

The Velum Obturator for the Mechanical Correction of Cleft Palate. *Cosmos,* LVII, 1915, 107. Abstract.

Mechanical Correction of Cleft Palate. Panama-Pacific D. Cong. Vol. II, 1915, 327-344, 12 illus. Disc. Vol. III, 273-280. *Items,* XXXVIII, 1916, 741-757.

Faculty Address. *Review,* XXIX, 1915, 925-933.

The Bodily Movement of Teeth in Orthodontia. (re Facial Development.) *Cosmos,* LVIII, 1916, 877-893, 16 illus. Disc. 926-931. *Ortho. Int. Jnl.,* II, 1916, 519-524. Abstract.

A Discussion of Dr. Edward H. Angle's Recent Method. *Items,* XXXIX, 1917, 241-267. 12 illus.

Modern Principles and Methods in Orthodontia. *Ortho. Int. Jnl.,* III, 1917, 695-750, 9 illus. Disc. 705-706.

Case from Practice. *Items,* XL, 1918, 113-126. 9 illus. Disc. 126-127.

Simplified Technic for Bodily Labial Movement. *Items,* XL, 1918, 871-879, 11 illus.

Open-Bite Malocclusion, its Causes and Treatment. *N.D.A. Jnl.,* V, 1918, 447-461, 13 illus. Disc. 461-467.

The Foundation Principles in the Mechanism of Speech, and the Importance of Training the Speech of Cleft-Palate Patients After Operation. *Cosmos,* LXI, 1918, 1-10, 1 illus, 134-143, 2 charts.

Etiologic Principles of Malocclusion in Reference to Treatment. *Items*, XLII, 1920, 680-687.

Dental-Occlusal Classification of Malocclusion. *Ortho. Int. Jnl.*, VI, 1920, 135-140, 1 table.

Principles of Retention in Orthodontia. *Ortho. Int. Jnl.*, VI, 1920, 627-642, 12 illus. Disc. 642-658, 8 illus.

Finishing and Polishing Inlays. *Australia D. S. Jnl.*, I, 1921, 271. Selected.

Mouth Breathing. *Australia D. S. Jnl.*, I, 1921, 288. Abstract.

A Remarkable Bodily Movement of the Teeth. *Cosmos*, LXIII, 1921, 715-719, 3 illus.

Principles of Retention in Orthodontia. *Items*, XLIII, 1921, 1-19, 12 illus. Disc. 19-47, 6 illus.

Etiologic Influences of Deciduous and Erupting Permanent Teeth with Principles of Treatment. Ortho. and Oral Surgery, *Int. Jnl.*, VII, 1921, 131-137, 1 illus. Abstract.

Laws of Biology Regarded as Etiologic Factors in Malocclusion. Ortho. and Oral Surgery, *Int. Jnl.*, VII, 1921, 306-314, 6 illus.

Practical Application of Biologic Laws. Ortho. and Oral Surgery, *Int. Jnl.*, VII, 1921, 365-370, 1 illus. Abstract.

Dr. Case possessed all the qualifications of a scientist, teacher, author and man. The dental historian of the future must accord to him a place among the truly great men in our profession. Time will assign him his rightful place in history. Twenty years, fifty years, hence, it will be easier to appraise his contribution to the settlement of vexed questions pertaining to orthodontia.

While preparing this manuscript I began to realize that Dr. Calvin S. Case, one of the brilliant minds of the dental profession, is with us no more. However, he will ever be in spirit our friend.

"Who once has had a friend has found
The link 'twixt mortal and divine;
Though now he sleeps in hallowed ground,
He lives in memory's sacred shrine;
And there he freely moves about,
A spirit that has quit the clay,
And in the times of stress and doubt
Sustains his friend throughout the day."

So after all, when we study the purpose of life, and the will of the Creator, we come to understand that

"The flowers we lay on Brother Case's grave
May wither and decay,
But always fresh his memory
Within our hearts shall stay."

Calvin S. Case, The Scientist and the Practitioner

By Hart J. Goslee, B.S., D.D.S., F.A.C.D., Chicago, Illinois

At this hour you were to have been addressed by the distinguished and beloved friend in whose memory this deserving memorial tribute is now being paid. Would that it might be possible for those of us here assembled to awaken, as if from a dream, and find that genial, courteous, cultured gentlemen here in body, instead of in spirit. And, yet, having an abiding faith in the serenity of the home to which his spirit has gone, and knowing that his life's work is ended, that it was done well, that he built an enduring monument while he lived, that as a reward he rests in peace, and that memories, works and benefactions which will endure always were left behind as a heritage and an inspiration to the young men of today, who would wish him back?

I have been asked to speak of Calvin S. Case as the scientist and the practitioner. I could speak better, perhaps, were I to speak of him as the friend, because I was fortunate in possessing his friendship, but the possession and inspiration of this cherished friendship and the sweetness of its intimacy makes it possible for me also to speak of him, briefly, though perhaps inadequately, as the scientist and the practitioner.

It has been said by one who loved him that Calvin S. Case was endowed with many of the most wondrous gifts of Nature. He was a student, he was a thinker, he had a keen, analytical and logical mind, and he had all of the ambition, persistency and energy which are the heritage of these higher attributes.

At the age of 24, he entered the ranks of the profession which he had chosen as his life's work, and in which he was destined to climb to the highest pinnacles of fame. Meeting with more than encouraging success from the very beginning, however, only inspired him to seek and attain to higher achievements, and, to broaden the scope of his mental horizon, he subsequently sought and obtained the medical degree.

Even thus equipped, he was still a reader and a student, and he soon developed a deeper and broader vision, a vision which lead him into the realms of biology and evolution. The names of Herbert Spencer, Charles Darwin and John Fiske were his beacon lights, and he was as familiar with their writings and teachings as he was with his own work in dentistry.

"The Excursions of an Evolutionist," by John Fiske, was his bible, and inspired him to study, to teach and to defend these principles religiously. His familiarity with these teachings and his sincerity of purpose were evidenced early by a long series of articles, written by himself, which appeared in his home paper, "The Jackson Citizen," beginning with the issue of January 19, 1887, a copy of which has been preserved and is now in my possession.

This very interesting and educational series of articles was inspired by an attack on the principles of evolution made by the minister of his own church. During his discourse the minister made the statement that the theory of evolution was unchristian-like and undignified, and that it "virtually consists of a process which grinds off a monkey's tail at one end, while it stuffs in brains at the other."

This statement aroused all of the serious and scientific tendencies and all of the fire and fight for truth which were in the mind and heart of Calvin S. Case, and he felt it a conscientious duty to answer him, which he did publicly.

These articles attracted the attention of John Fiske, brought from him a long letter of approval and congratulation, and were the means of inspiring and cementing a close personal friendship.

Through his writings he later became acquainted with Caroline Stackpole, professor of biology at Columbia University, and many other famous scientific teachers and thinkers, and these friendships were among his most cherished possessions.

How he found time to devote to the pursuit of the higher scientific studies, in addition to his rapidly increasing activities and responsibilities in dentistry, is almost beyond the most imaginative comprehension, and may be explained only by the truism that no man is ever too busy to find time to do that which he loves to do most.

He carried this wonderfully resourceful, well-balanced and scientifically trained mind into all of his writings and teachings in dentistry, and the profundity of his knowledge was recognized and admired by all and especially by those who were students of biology.

As a practitioner, Calvin S. Case was a true type of the ideal professional man. His office, with its sweet, cheerful and home-like environment, might have been the castle of a prince. His patients were made to feel as if they were members of his family. He took them into his confidence and into his heart, and he rendered to all alike the best that was in him.

Because of his personal charm and dignity, he was loved by all, and those who knew him best loved him most. As a beautiful evidence of this it is interesting to observe that during his long and successful practice in Chicago, extending over a period of nearly thirty years, he had but two office assistants, two sweet and faithful girls, and both were with him to the end.

His greatest achievements in dentistry were attained in the field of prosthesis and orthodontia. In the field of

prosthesis he was a wonderful teacher and a practitioner of marvelous skill and ingenuity. His best work, and his greatest humanitarianism, was displayed in the mechanical treatment of cleft of the palate, and so long as this pathetic affliction presents on down through the ages, the name and the work of Calvin S. Case will endure. In the field of orthodontia he was a pioneer, and he became the master. His work in this field of effort was nothing short of a highly scientific and yet rational application of mechanical wizardry.

While Calvin S. Case was a student of, and a believer in, evolution, yet he was not an atheist. He had faith in his God; he had faith in human nature; he had faith in himself. He lived for the good he could do, and he died a benefactor of humanity.

Calvin S. Case, The Man

By C. N. Johnson, M.A., L.D.S., D.D.S., M.D.S., F.A.C.D., Chicago, Illinois

The measure of a man is best expressed in those attributes which are not usually acclaimed as distinctive by the world at large. We are too inclined to yield homage to the spectacular and the flamboyant, rather than to those quieter qualities which make for a steady, sturdy, sterling manhood. The best things of life are not heralded before the world—they are hidden away deep in the hearts and lives of men ready to be used when the quiet occasion comes.

Calvin Case typified the best elements in what we know as a matured manhood. To him it was given to serve humanity in an art that brought out the best and noblest in his nature. He could not have achieved the wondrous work he did without having at heart the attributes of a man. A genius has been defined as a man "with an infinite capacity for taking pains," and yet there must be something more than this in an individual to be a man like Dr. Case. There must be that subtle something which we find it so difficult to define—the spark which lights the fires of vision and shows the way to things that the average person never sees. What a wonderful thing it is that certain men are given this sacred spark, this inspired glimpse into the inner recesses of Nature's storehouse of secrets! Were it not for men like these, the world would lumber along in the mire of the conventional and the commonplace, with never a light to illumine the highways and byways of life.

But greatness does not consist merely in the ability to see things and do things beyond the ordinary. Above all of this there must be the ever urgent quality of manliness, the thing that stands for stability of character, and for human sympathy. Being a man is better than being great. Being a man means the expression of all those humanitarian qualities that go to the making of a well-rounded individual unit. It means the development of a sentiment which reaches out to embrace in sympathetic interest all the sons and daughters of men.

That Calvin Case was a genius all will admit who knew of his achievements in the science and art of his cherished calling. He left the beneficent stamp of his individuality on everything he did, and the world will always be the richer for what he left it as a legacy. But Calvin Case was more than this. To those who knew him best there was a vein of the rarest metal in his make-up, a fineness of sentiment which expressed itself in a humanitarian interest in all those with whom he came in contact. No one could long associate with Dr. Case without being struck with his inherent love of humanity, and his splendid loyalty to his friends. It was the sweet savor which brightened his life and lent a charm to his daily existence. To doubt that Calvin Case loved his friends was to doubt the evidence of the senses, and to reflect on one of

the rarest attributes of which humankind is capable.

Manliness is probably best expressed by the manner in which the individual bears the slings and arrows of misfortune, and in this our departed friend stood sublime. He bore the ills he had with a calm reserve, which effectually hid from the world the fact that he suffered any sorrow, and this is manliness in its most exalted sense. To go on day by day smiling the smile of resignation in the face of strain and stress is to ascend the sacred heights of fortitude and enter into the kingdom of the elect.

Today we are paying our tribute of respect to the memory of Dr. Case in many of the relations of his active life. We are lauding his skill, his genius, his unparalleled ability, and his versatility. We speak of him as a writer, as a teacher, as an inventor, as a scientist, as a pioneer, as a practitioner, and as an artist. In all of these he distinguished himself in an unusual way, laying tribute to the whole world of dental science and of art. We are pleased to record our appreciation of the signal service he rendered humanity in each of these activities of his marvelous career. And yet above and beyond all of these there stands the sublime attribute which forms the motif of the present theme, the one without which all of the others must inevitably sink into insignificance. We admire his genius, we worship his skill, we pay willing tribute to his wondrous wealth of achievements in the world of letters and of science, but when the largest laurel wreath is laid we bring it with reverent hands and place it to the memory of Calvin S. Case—the man.

Calvin S. Case, The Orthodontist and Friend

By Thomas L. Grisamore, Ph.G., D.D.S., Chicago, Illinois

"Friend after friend departs; who hath not lost a friend?"

We are met to devote a short time to honor the memory of a friend, a man whose life was devoted to his friends, his profession and suffering humanity.

Such a one is, as it were, another self to whom we impart our most sacred thoughts, who partakes of our every joy and comforts us in our sorrows; added to this, his company is an everlasting pleasure. No task was too arduous, no sacrifice too great when the comfort or welfare of a friend was involved. To Dr. Case, a friend was something almost sacred, not some one he met today or yesterday, but one whom he had learned to admire after knowing him long enough to know he possessed the traits of character he so much admired in men. I remember on one occasion, when speaking of a gentleman he had known for years, he said, "This man has many faults but my friendship for him borders on affection."

As an example of the things he liked to do for men he admired or those who treated him with unusual courtesy, I will cite just one instance. He was much pleased with the treatment received at the hands of the surgeon who operated on him one year previous to his last illness. After he returned to his office from the hospital, while yet not strong, he planned an elaborate surprise dinner and gave it at Chicago's most exclusive hotel in honor of this surgeon, inviting not his own friends but thirty of the surgeon's most intimate associates. The names of the guests had to be secured from the surgeon's family; then they in turn were invited and given their part to play during the dinner hour. For these affairs with Dr. Case were no ordinary dinners; there was always a program and each guest had his part to play.

It is my belief that if the orthodontists of this country had known this great man as did the men who are today taking part in this program, the greatest wish of his life would have been gratified. And that was that the men prac-

ticing the specialty of orthodontia could and would have known him well enough so there could exist a more friendly, workable understanding—this was his great desire. However, this desire was not so strong as to prevent him from stating scientific facts as he saw them, or disagreeing with other men whose conclusions did not coincide with the facts as he found them through many years of experience.

He loved the practice of orthodontia and was happiest when in the company of men who were engaged in this special line of work. It was this desire that prompted him to invite all the orthodontists of his home city to his office, show a few interesting cases, and serve a buffet luncheon, or invite them to his club for a more formal luncheon and afternoon entertainment. Many times I have seen him much disappointed and disheartened, when he had been misunderstood or when possibly due credit was not given for principles he had advanced, but he was never bitter toward his critic. It was unbelievable to him that men could think the less of each other because they did not agree on scientific problems. He was a firm believer on certain orthodontic principles, and when conversing with young men, he would often say, "I will not live to see the orthodontic profession adopt these principles, but you will."

A persistent worker, if interested in a subject, he would stay at his desk during the entire night, yet he could forget all scientific and professional problems and play—this was done one day each week. However, to him play was work of another type, such as building boats, bird houses, archeries, making drawings, and writing specifications for some alteration on one of his buildings or boats. This was his entire recreation, unless occasionally when Saturday afternoon proved to be stormy and disagreeable, he would spend the time at his club playing pool, at which he was an expert.

Nature was kind to this man. She endowed him with a pleasing personality, a creative mind, and a desire to leave the world better for having passed this way. The young professional men would do well to study the physical, professional and financial life of Dr. Case. He was discharged from the army during the Civil War because of poor health, but owing to his analytical mind and strong character, this was in no way permitted to interfere with his future usefulness. At the same time, he was ever conscious of the fact that his health must be one of his first considerations.

Who is going to take the place of Calvin S. Case? This man entered orthodontia in its early infancy. There was no one for him to follow; originality was necessary. Appliances and results were visualized, then taken to his office, tried out in a practical way and the results given to his profession. He always looked forward—never back; and he was deeply interested in his profession and in the welfare of his patients to the last.

DIET IN ITS RELATION TO GROWTH AND DEVELOPMENT, WITH SPECIAL REFERENCE TO THE TEETH

By JOHN EDWIN GURLEY, D.D.S., F.A.C.D., San Francisco, California

(Read before the American Dental Association, Cleveland, Ohio, September 10-14, 1923)

Normal Diet for Adults

IN the foreword of a new book, "*Nutrition of Mother and Child,*" by Moore[1] are suggested three new vitamins: "scientific soluble A," or a scientific temper, which relates knowledge to practical needs; "common-sense soluble B," Nature's gift, so essential, and which may so often be overlooked; "sense of reality, soluble C", which takes cognizance of life, even human life. In these there is much for contemplation, and through their consideration we may make sure that we are moving in that direction which is bound to bring more of comfort and of happiness to humanity, for what, other than happiness, is the reason of our being?

The healing professions have passed through many fads, a recent one being that of "focal infections." We are now well into that of "diet", and, to me, one that gives evidence of producing more good to humanity than many of the others.

And yet, diet is but one of a number or a complex of forces which acts on the individual in his growth, development and maintenance. Food is necessary, for that is the channel through which the body-building elements are carried into the body, but for their proper assimilation, or in order to provoke normal physiological processes, rest and sleep, fresh air, play and exercise, cleanliness, pleasant surroundings, and happiness are positively essential.

History

In 1840, Liebig classified foods as follows: carbohydrates, proteins, fats, mineral salts and water.

Until very recent years, our knowledge of food and metabolism was based on this classification; the body required a certain proportion of each of these; protein for building and repair, fats for heat, carbohydrates for energy, salts for the hard tissues, (bones and teeth) and water. In addition to this, much dependence was placed on the calorie, or the energy unit which considers the value of food in proportion to the energy which it may provide. As a result, two schools of thought arose, one that taught the proper proportion of the various classes of food as described by Liebig, and one that taught "calorie values, protein content and digestibility" as the principal nutritional factors.

But valuable as was this knowledge, it soon became evident that one might be properly supplied with food from either of these standpoints, and yet starve to death. Evidence was accumulating which demonstrated the greater food value of some foods over others, so that, in 1911, Funk announced the theory of the vitamins.

These were first called "accessory food factors," but further experiments demonstrated certain of their properties, as well as their locations, and in time they

were named fat-soluble A, water-soluble B, and water-soluble C.

Since that time much experimental work has been done along this line, notably by McCollum[2], Mellanby[3], Mendel[4], Howe[5], Marshall[6] and others. Of these, perhaps, McCollum has made the most extensive reports, his experiments being conducted by what is termed "biologic method of analysis," that is to say, he provided a diet sufficient in quantity, which provided all of the classes of foods named above, and at the same time those which supplied these food essentials, the vitamins. He noted growth, reproduction, etc., rather than heat effects, as might be indicated by the calorimeter. From such, normal growth and development resulted, while any deviation produced abnormal conditions. Mellanby lays great stress on the presence or absence of the fat-soluble A factor, she having demonstrated the development of osteoid dentin and irregularities of the teeth, while Howe places his trust in the water-soluble B factor. With his work we must be thoroughly familiar, in that it has been so largely reported through our own literature. Mendel, though recognizing the value of all these essentials, and the part played by the vitamins, emphasizes the importance of the calorie or food energy and the protein content. He speaks of these as the "little things," or the "next-to-nothings," but the importance of which is immeasurable, due to so great a variety of proteins and protein parts. Lucas and Jones have just concluded an experiment in the Hooper Research Institute of the University of California, having given the skull to Marshall for the determination of dental defects, which shows that an animal fed on a balanced diet including vitamins, but in error only as to the balance of calcium and phosphorus, will show defective bone and dentin development, as well as calcification of the enamel, in a most alarming manner.

All of these experiments are intensely interesting and extremely valuable, so that within the next comparatively short space of time we may expect some very definite information relative to this most important subject, and hence, as mentioned in the beginning, out of it all will come something most serviceable to humanity.

Physiologic Uses of Food

The physiologic uses of food may be outlined as follows:

I. As a source of energy
   a. Muscular
      1. External
      2. Internal
   b. Body heat
II. As a source of building material
   a. Repairing worn-out tissues
   b. Construction of new tissues
III. As a source of regulating material for the operation of the body processes
   a. Assimilation of food—digestion
   b. Removal of waste from the body

Foods as required for the above uses are:

I. Energy or fuel foods: cereals, potatoes, sugars, fats, milk, eggs, meat and fish
II. Building material
   a. Protein or muscle forming substance
      1. Adequate: meat, fish, eggs, milk and cheese
      2. Inadequate: cereals, nuts, legumes and some vegetables
   b. Mineral salts: bone, tooth and blood-building substances: milk, eggs, meat, fish, vegetables and fruit
      (Of the mineral salts required, iron, calcium and phosphorus are the most important; iron is most available in egg yolk and green vegetables, and to a lesser degree in the blood of meat; calcium and phosphorus occur together, and in satisfactory form, amount and balance, in milk, eggs and cheese, though phosphorus is abundant in nearly all foods, meat, fish, whole grains, vegetables and fruits. Sherman[7] says that American diets are more likely to be deficient in calcium than in any other essential.)

III. Regulating material
  a. The vitamins
    1. Fat-soluble A (growth promoter) essential to children: whole milk, cream, butter, fat of egg-yolk, cod-liver oil, beef fat, glandular organs and leafy vegetables, such as lettuce, cabbage, celery, spinach and artichokes.
    2. Water-soluble B (tissue retainer) essential to adults: fresh milk, fruits, vegetables, meat, fish, eggs, and outer coating of grains, rice, etc.
    3. Water-soluble C (preventive of scurvy) essential to both child and adult: oranges, lemons, tomatoes, and cabbage juices are the best sources.
  b. Natural laxatives (elimination of waste matter): fibre of vegetables, fruits, outer covering of grains and water

Classification of foods to meet above requirements:

I. Vegetables and fruits: building and regulating value—little heat
II. Meat and meat substitutes: protein content, building value—little heat
III. Cereals and starchy vegetables: fuel value—little building
IV. Fats and oils: fuel value only
V. Sugars: fuel value only
VI. Water: regulatory and blood builder

A balanced diet must be so arranged as to include reasonable amounts of each of these.

Let us look at this question for a moment from another angle, that of body composition and, consequently, body requirement. Determination of the "element requirement" of the body reveals the need of carbon, nitrogen, hydrogen, oxygen, sulphur, phosphorus, fluorin, chlorin, iodin, silicon, sodium, potassium, calcium, magnesium and iron, with traces of manganese, copper and lead. Or a chemical study of the body shows these to exist in combination as follows:

I. Mineral or inorganic compounds
  a. Water: in the blood, etc.
  b. Acids: HCl in the gastric juice
  c. Bases: NH_4OH in the urine
  d. Salts: $Ca_3(PO_4)_2$, $CaCl_2$, KCl, NaCl, and many others in blood, urine, bones, teeth, etc.
II. Organic compounds or compounds of carbon, hydrogen, oxygen, nitrogen, phosphorus and sulphur
  a. Nitrogenous
    1. Proteids: albumin, casein, etc.
    2. Albuminoids: gelatin
    3. Simpler nitrogenous bodies: lecithin
  b. Non-nitrogenous bodies
    1. Fats of adipose tissue
    2. Carbohydrates: sugar
    3. Simple organic bodies: lactic acid.

Food must supply these, and in the following determination of "ultimate components" of foods, it is easily seen to be true:

I. Carbohydrates: sugar, starch, cellulose
II. Fats: fats and oils
III. Proteins: lean meat and fish, gelatin, egg-white, casein of milk, gluten of wheat, a large proportion of dried legumes and nuts, and a small proportion of grains
IV. Salts: table salt, salt of milk, vegetables and fruits; in fact, in much of the food as purchased
V. Water: as liquid or in apparently solid food
VI. Vitamins: in certain of the foods named above

Now in contemplating what has been said regarding this important subject, you will say, "why should there be such consideration given this; all of these are included in our dietary and hence are used?" But the fact is, they are not. Consider the number of breakfasts consisting of snails or doughnuts and coffee! The number of lunches at the ice-cream counter in which the principal or entire meal may consist of an ice-cream soda, or pie, pastry or cake and tea, coffee or cocoa! The numbers of dinners of lean meat, mashed potatoes, French bread, cake and tea! The number of delicatessen meals used in certain homes! The number of children who refuse vegetables! Bouillon cubes dissolved in

water and called soup! A child's lunch of macaroni, rice, white bread and cookies! This latter fills, but does not build. Think of the number of mothers who do not know how, or will not learn; so long as the child expresses no feeling of hunger, he is all right. The accompanying menus may indicate more clearly the possibility of error, both being a type quite common to our people. At first glance one might think both acceptable, but further study will reveal the insufficiency of No. 1 both in total amount of food, and animal protein, so essential to growth and development**. Compare for the moment No. 1 and No. 2.

No. 1*

	Cal.	P	F	C
Breakfast				
Wheatena	100	15	66	19
and milk, 7%	100	12	3	85
4 h. tbsp. 3 oz.				
Toast (white)				
3 by 3½ by 1 in.	100	14	6	80
Margarine (vegetable				
fat) 1 pat	100	1	99	0
Marmalade, 1 tbsp.	100	1	2	97
Sugar, 2 tsp.	50			50
Cup coffee	.....			
Total	550	43	176	331
Lunch				
1 Vienna roll	100	12	7	81
Macaroni	100	15	2	83
4 h. tbsp.				
Apple sauce	100	3	7	90
(1 large)				
Margarine (vegetable				
fat) 1 pat	100	1	99	0
Tea	.....			
Total	400	31	115	254
Dinner				
Soup, vegetable, 6 oz.	25	21	0	4
Roast veal, 2.7 oz.	100	71	29	0
size 2 chops)				
Mashed potatoes	100	6	9	85
1 average				
Steamed carrots		5	3	43
and peas, 4 h. tbsp.	100	14	2	34
Apple sauce, one	100	3	7	90
Sponge cake				
2 by 2 by 1 in.	100	11	19	70
White bread				
3 by 3½ by 1 in.	100	14	6	80
Margarine (vegetable				
fat) 2 pats	200	2	198	0
Tea	.....			
Total	825	147	273	406
Total for day	1775	221	564	991

*Figures from Nutrition and Growth in Children, by Wm. R. P. Emerson.

No. 2

	Cal.	P	F	C
Breakfast				
3 stewed prunes and	100	3	0	97
cream, 16%, 3 oz.				
Wheatena and cream,	150	8	126	13
4 h. tbsp.				
Toast (whole wheat)	100	12	3	85
2 slices 2½ by 2¾				
by ½ in.	200	32	6	162
Butter, 1 pat	100	1	99	0
Soft boiled egg,	100	36	64	0
1 large				
Cup coffee	.....			
Sugar, 2 tsp.	50	0	0	50
Total	800	92	298	407
Lunch				
Cold slaw salad	100	6	78	16
Macaroni and cheese		15	2	83
4 h. tbsp. 1 cu. in.	200	25	73	2
Apple sauce (1 large)	100	3	7	90
Corn bread,				
2 by 2 by 1 in.	100	10	24	66
Butter, 1 pat	100	1	99	0
Milk, 1 glass	100	15	66	19
Total	700	75	349	276
Dinner				
Cream tomato soup	200	20	140	40
Roast lamb, 1.8 oz.	100	41	59	0
(size 2 chops)				
Baked potatoes—one	100	6	9	85
Carrots and peas		5	3	43
4 h. tbsp.	100	14	2	34
Whole wheat bread				
2 slices	200	32	6	162
Butter, 2 pats	200	2	198	0
Cantelope, one-half	100	6	0	94
with ice-cream, 2 oz.	100	6	55	39
Tea	.....			
Total	1100	132	472	497
Total for day	2600	299	1119	1180

**McCollum suggests that too much meat is at present consumed.

Here by slight alterations we have raised the calorie value 50 per cent, and have thus provided a much better day's supply.

Whether the calorie value of food is of any physiologic significance or not in the arrangement of our menus, it does at least offer a very satisfactory basis for a mathematical calculation, and since the ordinary food-serving approximately represents the 100 caloric portion, we may quickly and easily determine the approximate value of a meal. It yet remains to become somewhat conversant with the characteristics of the various foodstuffs, whether carbohydrate, fat or protein predominates, and thus make calculations for the balanced diet. Looking over the day's menu just described, the proportion of each is as follows:

	Protein	Fat	Carbohydrate	Total
No. 1	222	564	991	1777
No. 2	299	1119	1180	2600

These figures represent the caloric or energy value of the food, from which we may determine the actual weight of each by dividing by the energy value per gram, thus:

NUMBER 1

Protein, 222 calories divided by 4 (number of calories per gram) gives 55.5 grams actually consumed.

Fat, 564 calories divided by 9 gives 62.7 grams consumed.

Carbohydrate, 991 calories divided by 4 gives 248 grams consumed.

The total edible foods named above weigh 366.2 grams, of which each is represented in percentage as follows: protein, 15 per cent; fat, 17 per cent, and carbohydrate, 68 per cent.

NUMBER 2

Protein, 299 calories divided by 4 gives 74.7 grams, or 15 per cent.

Fat, 1,119 calories divided by 9 gives 124.3 grams, or 25 per cent.

Carbohydrates, 1,180 calories divided by 4 gives 295 grams, or 60 per cent.

Both of these will be seen to be within the limits of correctness, so far as a balanced diet for the entire day is concerned, though each meal separately may show inaccuracies, save those in Menu No. 2, which are balanced. The dinner of Menu No. 2 may be slightly improved by substituting a vegetable salad, (lettuce, cucumbers, tomatoes and onions), for the tomato soup, or even adding the salad. However, any error in this as it stands would be cared for in the ordinary change of menu for each day. McCollum insists on the use of two salads a day.

It now remains to study these from the standpoint of vitamins and mineral salts. Of the former, Menu No. 1 is deficient in all, though providing a limited supply of the water-soluble B and water-soluble C, whereas Menu No. 2 provides a liberal supply of all three. As to the mineral salts, calcium, iron and phosphorus are the only ones that need be specifically considered, as a balanced diet will practically always supply the others. Of these three, Menu No. 2 again furnishes satisfactory amounts. Table 1 indicates the mineral content of various foodstuffs, and Tables 2 and 3 indicate the vitamins.

In Menu No. 2, then, we have established a satisfactory diet for an adult of average size, and in health, modifications being required for larger or smaller persons, persons engaged in different occupations or for children, emphasis being placed on the so-called "protective foods," "milk and leafy vegetables." These are rich in vitamins and calcium, hence, from the dental standpoint, extremely valuable.

HOBBIES

Caution must be exercised in the matter of making a hobby of any one or more of the various articles of diet; for instance, we hear much said relative to the use of white bread and its concomitant evil, constipation; the use of concentrated carbohydrates, candy, and that allowed to lodge between the teeth;

the use of hard food or other substances as a means of tooth and bone development; the use of bran or the dark breads to the exclusion of white bread, etc.

In reply to these, one might offer these suggestions. A well regulated daily regimen, in the matter of taking food in its proper proportion into the system, the establishment of regular habits in the matter of bowel evacuation, proper hygiene and happy surroundings, will take care, ordinarily, of constipation; carbo-

TABLE 1

Average Amounts of Common Foods Required to Provide One-Seventh of the Average Daily Need for Iron, Calcium and Phosphorus[a]

Food	Iron		Calcium (lime)		Phosphorus	
	Weight	Measure	Weight	Measure	Weight	Measure
Fresh meat	2 oz.	slice 4 by 3 by 1 in.	1 1/2 lbs.		3 oz.	
Fresh fish	2.4 oz.	piece 3 by 2 by 1 in.	1 1/2 lbs.		3 oz.	
Dried legumes	1 oz.	1-6 cup	2.2 oz.	1/3 cupful	1.6 oz.	3 tbsp.
Dried fruits	2 oz.	13 halves of apricots or 7 prunes	4 1/2 oz.	6 large figs or 1 cup of raisins	5.7 oz.	16 dates or prunes
Fresh fruits	12 oz.	2 bananas or 3 cups cherries	12 oz.	3 large lemons or 1 1/2 oranges, large	1 lb. 10 oz.	4 cups strawberries or 7 medium peaches
Fresh vegetables	5 oz. Class I 12 oz. Class II	See below	6 1/2 oz.	see below	13 oz.	see below
Whole cereals	2 oz. (raw)	2 cups cooked oatmeal	3 1/2 oz. (raw)	4 cups cornflakes	2.2 oz.	2 cups cooked rice
Whole milk	30 oz. nearly 1 quart	2.2 oz.	1/4 cup		6 1/2 oz.	1 cup scant
Eggs	2.4 oz.	1 1/2 to 2 eggs	3.8 oz.	3 eggs	3.8 oz.	3 eggs
Cheese	large		1/3 oz.	1/2 in. cube	1 oz.	1 1/4 in. cube
Spinach	2 1/2 oz. raw	1/3 cup boiled				
Bread	8 oz.	8 slices 3 by 3 by ½ in.	12 oz.	12 slices 3 by 3 by ½ in.	7 oz.	7 slices 3 by 3 by ½ in.

Vegetables Classified as to Iron Content

Class I—containing .0014 per cent of iron or more.

Spinach	Fresh lima beans	String beans
Green peas	Potatoes	Cabbage
Lettuce	Asparagus	Dandelion greens

Class II—containing .0006 per cent of iron.

Carrots	Beets	Onions	Fresh corn
Radishes	Turnips	Tomatoes	Celery

hydrate fermentation within the mouth is by no means responsible for all the havoc that we see there, but as it displaces or takes the place of the right food elements, proper tooth development is precluded; too hard food is not essential to proper growth and development, both of which are normal physiologic processes, and which are both taken care of and stimulated by the free use of vegetables—spinach or toasted bread representing the maximum resistance required. Bran bread, for instance, has but a very small food value, and the human body is unable to extract even that. Whole grain breads are to be preferred, though not to the exclusion of white bread, but alternately. As suggested in the early

TABLE 2[10]

VITAMINS IN FOODS

	A	B	C		A	B	C
Bread, white (water)	?	†	–	Tomatoes, (raw or canned)	††	†††	†††
Bread, white (milk)	†	†	?	Beans, kidney	*	†††	*
Bread, whole wheat (water)	†	††	?	Beans, navy	*	†††	–
Bread, whole wheat (milk)	††	††	?	Beans, string, (fresh)	††	††	††
Barley (whole)	†	††	–	Cabbage, fresh, raw	†	†††	†?
Corn, yellow	†	††	–	Cabbage, cooked	†	††	†?
Oats	†	††	–	Carrots, fresh, raw	††	††	††
Meat, lean	– to †	†?	†?	Carrots, cooked	††	†	†
Beef, fat	†	–	–	Cauliflower	†	††	†
Mutton fat	†	–	–	Celery	*	†	*
Pig kidney fat	† †	–	–	Cucumber	*	†	*
Oleomargarine	†	–	–	Dandelion greens	††	††	†
Liver	††	††	†	Eggplant, dried	*	††	*
Kidney	††	††	†?	Lettuce	††	††	†††
Brains	†	††	†?	Onions	*	††	††
Sweetbreads	†	†	*	Parsnip	–?	††	*
Fish, lean	–	†	*	Peas	††	††	†?
Fish, fat	†	†	*	Potatoes (boiled 15 min.)	*	††	†?
Fish, roe	†	††	†?	Potatoes (boiled 1 hour)	*	††	†?
Milk, fresh	†††	††	†V	Potatoes (baked)	*	††	†
Milk, condensed	†††	††	†V	Sweet potatoes	††	†	*
Milk, dried (whole)	†††	††	†V	Radish	*	†	*
Milk, skimmed	†	††	†V	Rutabaga	–?	††	†††?
Buttermilk	†	††	†V	Spinach, fresh	†††	†††	*
Cream	†††	††	†V	Spinach, dried	†††	††	*
Butter	†††	–	–	Squash, Hubbard	††	*	*
Cheese	††	*	*	Turnips	–?	††	*
Cottage cheese	†	*	*	Apples	†	†	†
Eggs	††	†	†?	Bananas	†?	†?	†
Almonds	†	†	*	Grape fruit	*	††	††
Cocoanut	†	††	*	Grape juice	*	†	†
Hickory nuts	*	††	*	Lemon juice	*	††	†††
Peanuts	†	††	*	Orange juice	†	††	†††
Pecans	*	†	*	Prunes	*	†	–
Walnuts	*	††	*	Raspberries (fresh or canned)	*	*	†††

† contains the vitamin
†† good source of the vitamin
††† excellent source of the vitamin
– no appreciable amount of the vitamin
? doubt as to the presence or relative amount
* evidence lacking or insufficient
V variable

part of this paper, the three new vitamins are very well chosen, or the following verse is quite apropos:

"A centipede was happy quite
Until a frog in fun
Said, 'Pray, which leg comes after which?'
This raised her mind to such a pitch,
She lay distracted in the ditch,
Considering how to run."

Two very good rules may be cited: 1. Eat regularly, three, four or five times a day, but do not eat continually. If it is necessary to eat more than three times, make this at stated times, midmorning or midafternoon, and then let it be "food," bread and butter or milk or fruit, not candy. 2. Remember the "protective foods," milk and leafy vegetables!

TABLE 3[11]

Table 3 gives the comparative vitamin values of certain foods.

Classes of Foodstuffs	Fat-soluble A or "Anti-rachitic" Factor	Water-soluble B or Antineuritic (Anti-beri-beri) Factor	Antiscorbutic Factor
Butter	† † †		
Cream	† †		
Cod-liver oil	† † †		
Mutton fat	† †		
Beef fat or suet	† †		
Fish oil, whale oil, etc.	† †		
Lean meat (beef, mutton, etc.	†	†	†
Liver	† †	† †	†
Kidneys	† †	†	
Heart	† †	†	
Fish, fat (salmon, herring, etc.)	† †	very slight, if any	
Canned meats	?	very slight	
Milk, cow's, whole, raw	† †	†	†
Milk, skim, raw		†	†
Milk, condensed, sweetened	†	†	less than †
Cheese, whole milk	†		
Eggs (fresh)	† †	† † †	?
Wheat, maize, rice, whole grain	†	†	
Wheat germ	† †	† † †	
Germinated pulses or cereals	†	† †	† †
Cabbage, fresh (raw)	† †	†	† † †
Cabbage, fresh (cooked)		†	†
Swede (turnips) raw expressed juice			† † †
Lettuce	† †	†	
Spinach	† †	† †	†
Carrots, fresh (raw)	†	†	
Potatoes, cooked		† †	†
Potatoes, raw	†	†	†
Onions, cooked			† at least
Lemon juice, fresh			† † †
Orange juice, fresh			† † †
Raspberries			† †
Apples			†
Bananas	†	†	very slight
Tomatoes (canned)			† †
Nuts	†	† †	
Yeast (dried)		† † †	

Diet During the Pregnant and Lactating Periods

If we wish to change the direction of a stream of water, the only logical procedure is to make that change at the source and not at the mouth or along the stream—its own force will be against us and will be too great. Similarly, in the prevention of dental caries, we shall not accomplish all that we should, nor even much, in child practice, and still less in adult supervision. Prophylaxis is valuable, but not all-sufficient. We must get back to the real beginning and change the forces in such a manner as to overcome those that destroy or allow the destruction of later life. How is this to be done?

The answer to this question appears to lie in the fact that we must look to tooth development before that development has begun, and it does seem simple so far as human hands have any control. We know the chemical elements, and, through their union, the compounds of which the teeth are composed, and these must be taken to the developing embryo, or, after birth, provided for the growing child. Hence, first attention must be directed to the mother-to-be. Is it unreasonable to suggest, as a part of our educational health campaign, that the woman contemplating the baby, or at least immediately after ovulation, preferably the former, consult her physician or obstetrician as to her physical condition, and receive careful advice as to diet?

McCollum says that "in the prevention of dental caries, the only effective measure is to adopt a policy which will result in the formation of a dental mechanism possessing its own barriers of defense. This involves the developmental factor, which those now out of infancy no longer have the opportunity to profit by, but we can easily, if we apply the scientific principles of nutrition to the daily life of the nation, leave to our children's children the priceless heritage of freedom from the physical suffering which we must bear, not only from mouth discomfort, but from rheumatism, heart disease, and other ailments having their origin in infected teeth."

There are two sources from which the growing embryo receives its growing material: (1) through food that the mother takes both for it and herself, and (2) from the mother direct, in case she does not take the food or takes it in insufficient quantity. The mother's body provides all the elements needed, though not enough for two. Food also supplies all the elements needed and can be taken in sufficient quantity for two. The advice required by the mother, then, is of twofold nature, namely, what foods best supply these elements, and in what quantities they should be taken in order to insure proper supply.

Tooth formation begins even as early as the sixth week of fetal life, and by the seventeenth week calcification begins, while at birth, calcification of the entire deciduous set is well advanced, hence the necessity of a proper supply of those necessary elements.

After birth the child takes his food direct, and at this time, or soon thereafter, calcification of the permanent teeth begins, hence again the need for careful supervision of food which must supply the elements. This responsibility devolves on the family physician or the pediatrician. Those who have the responsibility up to this time must either know the story of tooth development or seek the advice of the dentist, who in turn should be thoroughly familiar with the principles of nutrition as taught today, all of them remembering, however, that diet is only one of a number of

factors, as mentioned above, entering into the process of growth and development. We must know, too, that we cannot feed teeth alone, but that, as the body develops into perfection, so will the teeth, or as it develops into imperfection, so will the teeth, exceptions to the rule both ways notwithstanding. We must know that Nature cannot always, if really ever, be predetermined; science attempts to find the truth, and so in our work, we follow methods as indicated from past experience and from experiment.

Hence the answer to our question of how is this to be done apparently must be made by the combined efforts of the obstetrician, the pediatrician and the dentist. This is not entailing any service which should not be; each service is essential, and the scope is such as to make each a limited one. Furthermore, each person rendering that service should have as his aim the best possible product, so far as he is able to stimulate Nature in her efforts.

It is needless to say, of course, that those who care for children should have children as their first thought; we may care for the teeth of adults, by thinking in terms of teeth, but with children, the case is very different. Hence I am thoroughly convinced that the time is now here for the advent of the children's dentist, a man with a broad and liberal mind; one who can look to the past, the present and the future, and be able to advise; one who loves children both from the scientific and the social standpoints; one who can enter into the child's mind, and be with him, for a time; one who can take care of their aches and pains, but is ever looking to the time when these "will be no more"; and, above all, one who is a good man, because of the direct influence he will have on the future of those children who come under his care.

Diet During Pregnancy

The diet during this period need not be different from that under normal conditions. The pregnant woman might show idiosyncrasies toward some foods which normally she would not, and might then require a little greater care in selection. Likewise, she need not take her food in very much greater quantity, for the call of the developing embryo is not so great as might be expected. The most important consideration must be that of quality; it must be balanced, or have even a slight increase of the protein content. Foods supplying this are meat, fish, eggs, cheese and milk, especially the latter. The mineral content should be noted, the foods supplying this being milk, green vegetables, fruit, whole grains, eggs, fish and meat—green vegetables being the best source. The vitamin content is of especial importance, both in the matter of protection to mother and child and because of the fact that it is essential to the development of the child. Butter fat and leafy vegetables supply the fat-soluble A, which insures a healthy offspring with good bones and teeth. Water-soluble B is found in whole grains, fruits and vegetables, which should be provided in liberal quantities, while water-soluble C is found in fresh fruits and vegetables (especially oranges, lemons, tomatoes and cabbage juice), which should likewise be provided in liberal quantities. In fact, the diet will consist of fruits, vegetables, milk and milk products, whole grains, (bread and cereals), eggs and some meat.

Perhaps, as suggested by Moore[1], greater care need be exercised over what not to do than what to do, for he says: "1. She should be careful not to overeat. 2. She should be careful not to indulge in an unbalanced ration. 3. She should

avoid irregular meals and highly seasoned or very rich food. 4. She should curtail the amount of sweets. 5. She should indulge sparingly in meat or eggs, as these are liable to overwork the kidneys."

During the lactating period, the same rules apply. Perhaps a trifle larger quantity of food may be required, but to keep herself gorged with cocoa, milk and soups is wrong. These do not make milk and may injure the mother. Carefully controlled experiments have shown that if a mother be given a glass of milk and one egg or its equivalent in meat, the protein content of her milk will be normal.

The importance of diet is emphasized by Moore, who suggests that "there is scientific foundation for the belief that many of our childless homes may be such because of our incomplete diets, either in childhood or adult life, on the part of the would-be parents."

Diet From Birth to Two Years

There is no substitute for mother's milk for the baby—this should be its food, *a priori*. In case of failure, however, goat's milk or modified cow's milk may be used. Breast-fed babies have the best chance for good development, or even life, by about ten to one, it being stated that nearly 85 per cent of deaths during the first year are among bottle-fed babies. Grandison[12] has made a somewhat extensive report on "Teething and its Relation to Infantile Disorders," in which he says, "the child who has been naturally fed suffers much less from disorders coincident with the eruption of the deciduous teeth than his less fortunate brother who has been fed by artificial means." McCollum is very emphatic over the adoption of a good diet, including leafy vegetables, and the consequent reduction of caries in future generations.

In case it becomes necessary to feed the baby artificially, attention should be given, aside from that of milk, to the shape of the nipple. Most of those on the market are too long. Why not imitate Nature? Mother's nipple is short, and the breast large; the baby does not suck, but nurses—a sort of semi-mastication. With the long nipple of the bottle, however, sucking becomes necessary, with the result that the soft palate is forced upward, resulting in a constriction posteriorly, and a protrusion anteriorly.

Up to the sixth month, the breast-fed baby may need but one addition to its daily food supply, namely, vitamin C, which is best administered in orange juice or raw cabbage juice diluted with equal parts of water. This may be begun after the first month in teaspoonful doses, gradually increasing until at the sixth month a tablespoonful daily may be given.

After the sixth month an additional function of food is indicated, namely, that of exercise of the jaws as an aid in their development. At this time teeth begin to make their appearance, which means that the time has come for the child to begin taking hard food or food requiring mastication. This is known as the transition period and is extremely important, for if the liquid or semifluid diet is continued, the art of mastication may be lost. This is no joke, for children who cannot masticate can be pointed out, and this loss is undoubtedly due to failure on the part of parents to introduce them to food requiring mastication at this very time. Dry toast or zweibach is especially satisfactory for this purpose. At this time, too, other foods are added to the diet, cooked cereals, vegetable juice or soup, and by the eighth month, pureed vegetables, in-

cluding milk from the breast or bottle, if bottle-fed, and an increase to two tablespoonfuls in the amount of orange or cabbage juice. Tomato juice also supplies this vitamin and may be used in lieu of either of the above.

As the child grows older, the quantities of these are gradually increased until, at the ninth month, weaning begins, when the range of vegetables may be increased and whole grain cereals be used. Prior to this time, a satisfactory cereal is an equal mixture of whole grain and refined products, the former alone being unsuitable to the infant. At ten months the pulp of cooked fruit and baked potato served with butter may be added, while at fifteen months, meat and other milk products, such as cottage cheese, may be given. At this time, too, starches in other forms, such as macaroni, spaghetti or rice may be included. From now until the twenty-fourth month this will constitute his diet, in gradually increasing amounts, though, at the approach of the second year, desserts in the form of custard and light cakes may be allowed.

Dentists will probably never be called on to give specific instruction in the matter of a child's diet, but it is highly important that we should be familiar with the proper food, for, from our standpoint, the critical part of the life of the individual is prior to the second year. Early in fetal life calcification of the teeth begins, and by the end of the second year calcification of the deciduous teeth is practically complete. At this time, too, calcification of the permanent set is well started, and we do need to know whether or not the food taken has supplied the necessary minerals to make calcium phosphate, calcium fluorid and calcium carbonate for the teeth, or the necessary vitamins to bring about proper assimilation.

These articles of diet have been taken from lists prepared and used by our foremost pediatricians, and a careful study will reveal their value. We must always remember, however, that teeth cannot be fed alone, but that a well-fed child will usually be a well-developed child, and this includes the teeth.

The old definition of "dental caries," as written by the late John Sayre Marshall, is a good one and one that should be the constant mental companion of us all, but it is not sufficient in the light of present day knowledge. I am interested in seeing what the new definition will be and who will write it, for surely the lodgment of food between the teeth and the subsequent fermentation of carbohydrate material is not responsible for all the tooth destruction that we are called on to treat. The normal resistance, due to food or all of those things which go to make the well developed child, must play the greater part, or, conversely, the lack of resistance in the ill developed child must be due to a lack of these same things. McCollum enumerates a great many contributing factors in child growth and development, but the "greatest of these," he says, "is food."

Harold DeW. Cross[13] suggests that "it might be better to call dental caries a prenatal and infantile disease which is unrecognizable at this stage but which manifests itself later during childhood, finally largely eliminating itself through lack of suitable material." (In mentioning caries, especially of the deciduous teeth, abscess must be thought of as well, for they are concomitant evils.)

Edwards A. Park[14], Harvard Medical School, says that, "if pregnant women received ample, well-balanced diets, in which green vegetables were

abundantly supplied and cow's milk was regularly taken, and kept a sufficient part of their time in the open air and sun, and if their infants were placed in the direct rays of the sun (window glass filters out the radiations that prevent and cure rickets) for a part of each day and were fed cod-liver oil for the first two or three years of life, more could be accomplished in regard to the eradication of caries of the teeth than in all other ways put together, and rickets would be abolished from the earth."

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Discussion

Wallace Seccombe, Toronto, Canada: Dr. Gurley has presented tables of diets showing the number of calories in each case. We should bear in mind that it is the organic, and not the inorganic, constituents of the food that determine the number of calories, or heat units. When food is burned (oxidized) outside the body, the organic portions (fat, carbohydrate and protein) produce heat units, while the inorganic elements (salts) remain as ash. In the human body, as energy is expended, oxidization occurs in much the same way, and we speak of the heat units as so many calories. The inorganic salts, though not adding to the number of calories, are nevertheless vitally important food constituents.

A few years ago we heard much more about calories than we do today. As a matter of fact, the average person ordinarily consumes more than enough food to supply the necessary number of calories to compensate for the amount of energy expended.

There is, however, in the modern diet a very serious deficiency in the inorganic salts and particularly in the tooth-forming elements, calcium and phosphorus. The inorganic salts in the body form the skeleton and teeth, and are essential elements of the protoplasm of the cell. They are held in solution in the fluids of the body, maintaining alkalinity and influencing elasticity and irritability of muscle and nerve. Each one of the salts has a special duty in metabolism, and sometimes their functions are antagonistic. For instance, potassium is concerned in the dilatation of the heart and calcium in its contraction.

Regarding the source of these salts, it is a moot question whether in their organic form they are assimilated to any great extent in the human body. The sun and other forces of Nature elaborate these elements of the soil in a most wonderful and complex way, changing them from the mineral to the vegetable kingdom and converting them into vegetable forms suitable for animal food. They link, dietetically, the mineral, vegetable and animal kingdoms. When these natural chemical combinations are destroyed by heat, desiccation, or milling process, essential food values are lost.

Vitamins, in place of being new substances of unknown composition, may ultimately be found to be conditions of matter, namely, the organic combinations of the inorganic salts. Varying degrees of heat or drying or of manufacturing processes are said to destroy vitamins. But might it not be said, with equal truth, that the heat or other influence destroys the complex biologic combinations of the organic and inorganic elements and thereby destroys essential food factors? This view is urged, not that the importance of the so-called vitamin factor may be considered less, but rather that the natural inorganic food salts may be valued more.

Dr. Gurley has named six essentials of a balanced diet. The body regulator factor ought to be particularly stressed, and under modern methods of living it should be placed first on the list. Bran, cellulose and roughage are of great value as body regulators. The free and frequent evacuation of waste products is absolutely necessary to health, and a physiologic diet is such as to bring free elimination about in a natural, normal way, without resorting to cathartics or other drugs.

Dr. Gurley asks the question, What should be the diet of the woman during pregnancy? In view of the unusual demand of the fetus for boneforming elements, the food during pregnancy should contain more calcium and phosphorus than ordinarily required; the best foods are milk (whole, skimmed or buttermilk), cheese, figs, cauliflower, egg, spinach, and practically all the leafy vegetables and fruits. Little value, if any, would result from ingestion of the inorganic salts in inorganic forms—they must be taken in foods in organic biologic combination.

The inorganic salts and the protein in foods are usually combined or closely associated. Experience shows that if the natural food salts are included in the diet, little worry need be felt regarding the supply of protein.

Dr. Gurley states that there is no substitute for mother's milk for the baby. This is quite true, providing the mother eats the proper food and includes the necessary elements in her diet.

Nature cannot transpose one element into another; the mother must take in her diet the elements necessary for the child, otherwise properly modified cow's milk is, to my mind, preferable. No mother worthy the name refuses to nurse her baby if she is able. Many mothers cannot nurse their babies because of wrong diet. The great effort and expense that many departments of health put into propaganda for the purpose of encouraging mothers to nurse their babies would, to my mind, be better spent in an intelligent effort to educate the mother in scientific feeding that she may satisfactorily nurse the babe and supply the child with a balanced food containing the essential elements.

Regarding the bottle nipple, the suggestion is that the nipple be short and of a form to permit the baby to obtain food, not by suction, but by a semi-mastication pressure. Personally, I cannot see how Nature's method can be exactly simulated in the use of any artificial device, nor how the use of the force of suction can be dispensed with.

THE IMPORTANCE OF PROPER TECHNIC IN THE ADMINISTRATION OF NITROUS OXID AND OXYGEN

By CHARLES K. TETER, D.D.S., Cleveland, Ohio

(Read before the American Dental Association, Cleveland, Ohio, September 10-14, 1923)

IT has occurred to me many times that sufficient stress has not been placed either on the technic in the administration of the anesthetic or on the administrator.

The facts presented here to you have been taken from my personal experience in the administration of more than 70,000 anesthetics without a fatality; of this number, more than 18,000 have been given for tonsil and adenoid operations, over 16,000 of which have been given in cooperation with Dr. J. N. Lenker of Cleveland; 40,000 or more have been given for oral surgery, and over 10,000 for general surgery.

The successful anesthetist should be an artist with a scientific training. These two requisites are essential and inseparable. Human nature falls deep in the slough of despondency when facing a general anesthetic; therefore, the administrator must be keenly alert, congenial, tactful and of an even and sympathetic temperament. He should have such confidence in his ability and methods as will command the full confidence of his patient; decisions should be made quickly and accurately, as in an emergency it may mean life or death to the patient. There is no other branch of the dental profession that may jeopardize a life as much as this one.

There has been much discussion recently regarding postoperative complications, such as lung abscess and pneumonia. I have never had to deal with any of these, either in my own work or in that of the throat specialists with whom I have worked. Dr. Lenker considers this largely due to the fact that the patients are not saturated with ether, the throat reflexes being retained, and also to the fact that the reclining posture used prevents any foreign substance from being inhaled.

Genius and native ability are valuable assets of the anesthetist, but great concentration, much repetition and love of the work are also required to produce the most skilled anesthetist. It is out of the question to expect all dentists to be artists, and yet they do possess more than the average amount of artistic tendencies to become successful dentists. This is one reason why dentists usually become proficient anesthetists when taking up this line of work.

One must have more than a general knowledge of physiology and the functions of the heart, lungs, kidneys and other organs of the body. He must be familiar with the pathologic conditions of these organs and the normal and pathologic conditions of the intricate nervous mechanism.

There has been a practice in recent years for many of the leading surgeons and hospitals to employ nurses and lay persons for the administration of their anesthetics. This practice is based entirely on commercial considerations and

should not be sanctioned by either the profession or the public. The nurse, as well as any other person not having had the scientific, thorough, special training in this field, is entirely unfitted to be trusted with a human life.

With the rapid progress being made in every field of science and industry, the time should be past for any mushroom growth specialty to spring from the medical or dental professions. I am opposed to all these so-called private instruction courses that have had more or less popularity during the past fifteen years, for at best one can gain but a smattering of the fundamental principles. I do not censor anyone for giving these courses, nor those who have taken advantage of that which they offer, but I do say that the time given to these courses is far too short for sufficient training for a successful anesthetist. Up to the present, the dentist wishing to specialize in anesthetics or oral surgery has been greatly handicapped, owing to the fact of lack of opportunity to receive special and thorough training. At the present time, many of the leading schools are offering postgraduate work in these fields, and they should be more frequently elected.

All too often my observations have led me to realize that the real importance of a good anesthetic is not appreciated by the average person. If you had to subject yourself to the ordeal of having your appendix or tonsils removed, you would not knowingly select an inexperienced surgeon or one whose technic you knew to be faulty. Then why be indifferent to the kind of an anesthetic used and the method employed in its administration? With sufficient nerve you could survive the surgery without an anesthetic at all, but an anesthetic given without proper technic might prove fatal.

I have dwelt somewhat at length on the requirements of the anesthetist and the methods used for the development of technic, but to me this is all important. Nitrous oxid and oxygen requires more attention to details than any other recognized anesthetic. Its safety depends proportionately on the manner in which these details are understood and executed.

Nitrous oxid and oxygen is a safe anesthetic because it causes less chemical reaction in the organism and less disturbance to the delicate nervous mechanism than any other agent. Unfortunately, it is an asphyxiant as well; herein lies practically the only danger from this anesthetic agent. The border line between anesthesia and asphyxia with nitrous oxid and oxygen is so narrow that great skill is required to carry the patient along this narrow path. In a perfectly normal case this is a comparatively easy matter, but a perfectly normal case is a rarity. There are numerous conditions encountered that will alter the administration of the anesthetic, such as temperament, general health, the habits of the patient, the nature of the operation and obstruction to the free interchange of inspired and expired gases.

Use of pure oxygen.—It is necessary in administering nitrous oxid to use it from 80 to 95 per cent pure in order that the nerve cells may become sufficiently saturated to produce the anesthetic state. This being true, there is not enough oxygen available in the atmosphere to make nitrous oxid respirable over an extended period of time; therefore, it becomes necessary to use pure oxygen to prevent anexemia or oxygen starvation.

Maintenance of a definite and even flow of the gases.—I consider this the most essential principle involved in the successful administration of gas-oxygen. Attention has been called to this many, many times and it is the only way that exactness of dosage may be approximated. With a definite and even flow of the gases, the anesthetic tension is soon established, and when the proportions are correct for each individual case, it is not necessary to change the proportion of

the gases to any great extent throughout the operation. No definite percentage of the gases is uniformly satisfactory for different patients, or even for the same patient, for numerous factors enter into this, such as the type of patient, depth and frequency of respiration, volume and tension of the circulation, reflexes from surgical trauma and degree of shock encountered.

Administration of warm gases.—It is an established fact that all anesthetics are safer when administered warm, Gwathmey of New York was the first to experiment on animals with warm and cold nitrous oxid. He found that nitrous oxid administered warm was over twice as safe as when given under normal temperature, and from three to five times as safe as the cold gas. Also, that all anesthetics heated to body temperature are increased in value, as regards life, without any decrease in their anesthetic effects. My clinical experience has substantiated Gwathmey's results, not only in regard to the increased safety of nitrous oxid as an anesthetic, but also in the conclusion that anesthesia is induced more quietly and profoundly.

In a series of forty cases, I compared the length of time to produce anesthesia with warm and cold nitrous oxid. Pure nitrous oxid was used, and anesthesia was marked by the absence of the lid reflex and the beginning of stertorous respiration. The average time consumed in producing anesthesia with nitrous oxid at 90°F. was thirty-two seconds, and the average time at 42° was fifty-six seconds. Many of the patients to whom the warm gases were given said that they were not conscious after the second or third inhalation, while most of those taking the cold gases were conscious up to the tenth, and some up to the twentieth inhalation. All of these patients were women of from 18 to 60 years of age.

Warm nitrous oxid is more readily absorbed by the blood than cold gas, and the resulting anesthesia is more profound. About 90° F., in my experience, is the best temperature for inhalation. The warm gases should be at this temperature when they reach the inhaler; a higher temperature raises the body temperature 1 or 2 degrees in some instances, and exhaustion will quite frequently be noticed.

Re-breathing of the gases.—The re-breathing of nitrous oxid is not new, having been used to a certain extent from the time of its discovery. Hewitt speaks of "to and fro breathing," but I understand that his experience was confined to the use of this method only to the extent of inducing anesthesia, and not to its continuous application. Many men have been using some method of re-breathing for years. To Gatch[1], formerly of Baltimore, however, probably belongs the credit for placing the re-breathing of nitrous oxid on a scientific basis. He employed a method of re-breathing on a large number of patients during his internship at the Johns Hopkins Hospital. I had been using the re-breathing of the gases for some time before this, as I have used it since September, 1907, in all of my general surgical cases.

Being aware of the fact that the exhalation of the patients under nitrous oxid-oxygen anesthesia contained about 80 per cent of nitrous oxid, I have utilized the exhalation as much as possible, still keeping the tension of the nitrous oxid up to the extent necessary to produce surgical anesthesia, and allowing enough oxygen to eliminate the asphyxial factor. My purpose in using re-breathing was to conserve the nitrous oxid and oxygen on account of cost. I found, however, that a more satisfactory anesthesia with no alarming symptoms or deleterious results was obtained by this means.

1. Gatch, W. D.: The Use of Re-Breathing in the Administration of Anesthetics, Cosmos 54:242, 1912.

The proper amount of re-breathing of nitrous oxid and oxygen must be governed by the symptoms in each individual case. If too much re-breathing is allowed, the patients will show symptoms of light anesthesia quickly followed by asphyxial manifestations, and an excessive amount of carbon dioxid will be manifested, first, by rapid forced respiratory efforts, followed by sweating, livid appearance, rapid, thready pulse and finally, by cessation of respiration.

Utilization of positive intrapulmonary pressure of the gases.—It is known that the blood will absorb forty-five volumes of nitrous oxid to 100 volumes of blood at atmospheric pressure. I have found that more profound anesthesia resulted when nitrous oxid under positive pressure was administered. This indicated that a greater amount of gas was absorbed or taken up when increased pressure was used.

In 1907, I began to use positive intrapulmonary pressure in the administration of nitrous oxid and oxygen for surgical purposes. My first work of this kind was for Dr. C. B. Parker of Cleveland. The operation consisted of the resection of four or five ribs for extensive empyema involving both lungs. I have administered nitrous oxid and oxygen with positive pressure for intrathoracic surgery in over 100 cases, being able to control accurately the pressure of the gases, and I have never encountered even a temporary cessation of respiration in a single case; I soon noticed that more profound narcosis resulted when positive pressure was used than when it was not. I have, therefore, utilized this additional factor in all of my subsequent work. I have been able to administer nitrous oxid with excellent results in all intrathoracic surgical cases which have been presented. The lungs could be held in a normal position or could be extended more or less, if desirable. The best working pressure in my experience is from 6 to 8 mm. of mercury, but a much greater pressure, however, may be used without occasioning any alarming symptoms. In patients possessing heavy, powerful, muscular chests, a pressure of from 24 to 30 mm. of mercury may be employed to advantage. That it is a dangerous practice to use positive pressure in anesthetic work is a theoretical objection, which is not borne out by the clinical facts. It is essential, however, that the pressure employed be known, a very simple positive pressure valve making this possible. Utilization of a positive intrapulmonary pressure in the administration of nitrous oxid is not dangerous; on the contrary, it is an important factor in the production of profound and safe anesthesia. In addition to this, it renders possible the safe performance of intrathoracic surgery.

It seems unbelievable to me that there still are men in the dental and medical professions who do not know that it is possible and practical to keep a patient under a nitrous oxid-oxygen anesthesia to the completion of any operation. Leading anesthetists and many others have been using it for prolonged anesthesia for over twenty years, and yet we are sometimes asked "Can you keep the patient asleep until the removal of all the teeth or during the period of some difficult operation?" As a matter of fact, the greatest difficulty encountered in any general anesthetic is the first five minutes, and a continuation is comparatively simple. I consider the extraction of teeth to be strictly surgical work, and an anesthetic is indicated, either local or general, but I do not see the necessity for using both. Neither do I see the advisability of using a local anesthetic for the dissection and exposure of an impacted tooth and then administering nitrous oxid and oxygen before actually removing the tooth. To me it would indicate that either the operator is not sure of his technic in nitrous oxid and oxygen anesthesia, or his operative technic is at fault. If

the overlying tissue has been properly removed from an impacted tooth, additional anesthesia should not be necessary.

In all intraoral operations, the nasal administration of the gas should be used, and in the case of tonsillectomy and adenectomy, the mouth tube is used with the nasal inhaler, for the reason that the volume of gas forced through the nose alone will spatter blood in the operator's face, unless the bloodless operation is performed, which is impossible when adenoids are removed. For operations in the oral cavity proper, the nasal inhaler is excellent, and anesthesia is quietly induced and maintained to the completion of any operation, if the general conditions are satisfactory.

One of the difficulties with the anesthetic that we have to contend with in oral surgery is mouth breathing. This may be prevented to a certain extent by using surgical sponges, properly placed so that the field of operation is not obstructed. These sponges are made of 4-ply gauze, 2 inches wide and 12 inches long, having a 12-inch tape attached to them, and this tape is left out of the mouth; in case one of these sponges should slip too far back in the throat, it can be quickly removed, and I assure you the time will come when this precaution will be appreciated. Care must be exercised that these sponges are not pressed against the soft palate, or that the tongue is not pressed back into the larynx, as in either case breathing will be interfered with. As the sponges become soiled with blood, they should be removed and replaced with clean ones. By properly using these sponges, one can accomplish continuous nasal breathing, a clean operative field, and most important of all, the prevention of foreign material, such as teeth or old fillings, from entering the larynx or stomach. A number of such accidents have resulted in serious injury and death. I also consider this one reason for not having postoperative pulmonary complications.

I wish to emphasize the fact that a quick induction will eliminate most troublesome complications. This is done by administering pure nitrous oxid under slight pressure, for from five to ten inhalations, depending on the appearance of slight cyanosis, never carrying it to the point of jactitation of the muscles, or other asphyxial symptoms, except the slight cyanosis. This method of induction will eliminate the excitement stage and a much more tranquil and relaxed anesthesia will thus be attained. Before anesthesia one is safeguarding himself if he asks a few sensible questions of his patient as to any physical ailment.

Another difficulty, easily overcome, is in those cases in which one has a collapse of the alae nasi. Fortunately, these cases are rare. One should have a number of different sized, thin walled, sterile rubber tubes at hand, of the largest size that can be inserted in one nostril. A piece about 1 inch long should be cut off and inserted in one nostril only, using a small safety pin through the end of the tube to keep it from slipping into the nose too far. One tube will be sufficient, and will not interfere with the proper placement of the nasal inhaler. These tubes should be lubricated before inserting.

In controlling children, I have found the following method of much assistance: First, it is important to secure their entire confidence, if possible. When the child is placed in the chair, an old-fashioned roller towel is passed over his head, confining his arms and hands. This may be done without creating any suspicion of your desire to restrain him. One leg of the operator is put through the towel at the back of the chair, and the inhaler is applied. If the child should attempt to resist, the leg is pulled back, and the child can neither slip down in the chair nor raise his hands to pull off the inhaler. One can quickly anesthetize the patient and

avoid what might have been a very unsatisfactory experience for both oneself and the parents of the patient. The instinct of life preservation is very tenacious, and one must expect any child to follow this instinct. A terrified and excitable patient will not react well under any anesthetic and much care should be employed.

Surgery for the half century prior to the last decade made little scientific progress. While the art of anesthesia advanced with the increasing demands of surgery, and the lore of the individual anesthetist was accumulated, each surgical narcosis was achieved according to the personal recipe of the anesthetist. Largely because of the difficulties of confining and measuring matter in such an elusive state as the gaseous, the precision and accuracy of dosage, which came to be demanded essential in the administration of liquid and solid drugs, secured no place with the volatile anesthetics. Anesthetization was accomplished according to certain empirical methods and formulae, guided by the reaction of the patient. Granting that such empirical anesthetization in the hands of the skilled anesthetist may be ever so perfect, yet, if these methods permit of no formulation, uniform results cannot be achieved, nor can methods be standardized. Further, high skill in anesthesia by these empirical methods involves a rare natural aptitude and long training. Therefore, the trend of the present is toward the exactness of dosage and the perfection of technic of administration that will place anesthesia on the basis of an exact science.

Discussion

B. H. Harms, Omaha, Nebraska: Two other important points should be emphasized: (1) the surgery must be made to fit the anesthesia; and (2) there must be a competent surgical team. A dentist cannot do the best for the patient or himself by trying to work alone, by operating and anesthetizing at the same time, for anything more than the short-time case. The surgical team permits all of the little details which make an operation under this type of anesthesia successful. However, I have seen this anesthetic make the very poorest kind of showing in the hands of both an expert anesthetist and a fine operator in the mouth, simply because the surgeon did not handle himself properly and his work in the mouth so interfered with the anesthetic that the case was all but a failure. In other words, there was no teamwork. The anesthetist could anesthetize successfully for someone else, and the surgeon was a fine operator with some other form of anesthesia, but together they were absolutely in the wrong place—there was no teamwork.

About the first thing a dentist does after his second case of failure with nitrous oxid-oxygen anesthesia is to begin loading his patients with pre-anesthetic drugs with the idea of knocking all of the resistance out of the patient. I would like to ask just how many times one has ever heard any of these men tell how to keep the patients' resistance up so as to favor their recovery? Did their pre-anesthetic medication ever include alkalization? I do not mean to say that pre-anesthetic narcotics do not have their place, but to use them promiscuously without proper respect for their contraindications is to invite an accident for which the anesthetic will be blamed. For instance, I know of a case in which a physician gave a girl ¼ of a grain of morphin for pain in the head, and in eight hours she died of diabetic coma. If an anesthetic had been used in this case after the injection of morphin, it surely would have been blamed for the death, and particularly if the dentist had used nitrous oxid and oxygen.

I cannot see any great amount of objections to the private instruction courses mentioned by Dr. Teter as long as the instructors are legally qualified dentists or physicians and since there is as yet no real school of anesthesia that will prepare the dentist to do anything more than the usual ordinary short-time cases of extracting teeth under nitrous oxid and oxygen anesthesia, and in no cases are his assistants trained with him. However, the feature that is objectionable is the so-called instruction in anesthesia given to the dentists by the laymen, dental supply men and the like, for a price. So long as the state boards will shut their eyes to this practice with the consent of the powers that control dental affairs, just so long will the dentist be taught anesthesia by the laymen. On the one hand, the student who graduates from the dental college must pass the state board examination, which includes the subject of anesthesia; and, on the other hand, the state board allows the lay anesthetist to organize a class and collect his money, and then the members of the board justify themselves by saying that as long as he does not

work in the mouth he is not practicing dentistry, and that, besides, the dentists in the class would be legally responsible for any accident. Just who is being trusted with the patient's life? I take it that the instructor, at least, selects the patient on whom he wishes to demonstrate.

In my college work, I am continually trying to teach my boys that no anesthetic can be used promiscuously and that I would rather see each of them lose fifty patients a year, through their refusal to serve the hazardous risk, rather than have one accident in their lifetime of practice.

In regard to the use of warm gases, I would like to ask Dr. Teter with just what kind of warming apparatus can the temperature of the nitrous oxid and oxygen be determined at the inhaler? I have discontinued the use of the warming apparatus for a number of years because I felt that by the time that the gases reached the inhaler they would not be more than at room temperature.

May I also ask Dr. Teter to give the profession one more message, namely, for that class of patients which routinely walks into the dental office for the removal of teeth with nitrous oxid-oxygen anesthesia, by what means do you determine their fitness for anesthesia, by what means do you determine poor risks for further examination?

J. A. Heidbrink, Minneapolis, Minnesota: My observations do not coincide with Dr. Teter's statement that, by hastening the anesthesia by administering pure nitrous oxid from the beginning, troublesome complications will be avoided. Too rapid displacement of oxygen by nitrous oxid seemingly causes the sense of suffocation which the patient often mentions on recovery. Obstreperous patients often resent this discomfort, and struggling is precipitated. Much of this is avoided by supplying some oxygen for the first period of induction, and until analgesia or light anesthesia is established.

Guedel,[1] in 1922, explained the interchange of oxygen and nitrous oxid between the alveolar pulmonary space and the blood, and the absorption of these gases from the blood into the nerve cell. In this article he states: "With the rapid displacement of oxygen from the blood before there has been time for nerve cell absorption of nitrous oxid sufficient to produce unconsciousness, there will occur in the majority of cases a sense of suffocation due to the lack of oxygen in the yet conscious patient. It is usually this experience that causes patients to express a dislike for gas anesthesia. They remember it. The remedy is simple. The oxygen content of the blood must be maintained for adequate tissue respiration in each case, until there has been sufficient nerve cell absorption of the nitrous oxid to produce unconsciousness."

I believe that the manner of inducing anesthesia with nitrous oxid is most important, because a well-established anesthesia on an even plane before an operation begins is doubtless the greatest factor in anesthesia maintenance for oral surgery, where there is the ever present possibility of the patient obtaining air through the open mouth.

E. I. McKesson, Toledo, Ohio: After graduation, the average man does not read even his *old* books on physiology, pharmacology and pathology, and but few buy new ones. How, then, can he apply these sciences in modern anesthesia if he does not know something of their advances? Patients do not come to us hand-picked, sorted and standardized, nor do they react alike to a standardized dose. It is our business to handle all patients successfully, and it is accomplished only by understanding the signs which they exhibit during narcosis. Technic then becomes rational, flexible and sure, and the results are generally satisfactory.

Except in a few places, momentary anesthesia in dental operations is no longer practiced, although it is not usually so prolonged as in abdominal surgery. During the period of maintenance, which interests us most, three things may occur to disturb the smoothness of narcosis, which therefore require attention: 1. The proportion of nitrous oxid and oxygen is not correct for the patient, since signs indicating a different mixture are then in evidence. 2. The pressure of the gases in the nasal inhaler may be insufficient to accommodate the inspirations without air inhalation through the mouth. Nasal obstructions of varying degrees require supplementary tubes to the mouth or greater pressure, or both. 3. Interference with respiration by operative manipulations quickly disturbs the patient's oxygenation and usually necessitates a temporary increase in the oxygen content of the mixture to compensate it. 4. The mouth is not sufficiently or properly packed to prevent a filling, root, tooth, blood or saliva from reaching the larynx. For this purpose, the largest pack that can be used seems to give the best results, greatly reduces the waste of gases through the mouth and makes re-breathing possible.

I agree with Dr. Teter on the technic of induction, starting with pure nitrous oxid for quick unconsciousness, after which I take plenty of time to secure the proper state of narcosis before beginning an operation. A

1. Guedel, Arthur E.: The Faultiness of Rapid Induction of Anesthesia with Nitrous Oxid, Current Researches in Anesthesia and Analgesia, October, 1922.

little extra time spent on stabilization at the beginning often saves annoyance during the operation if it is a prolonged one. This is especially true in anesthetizing alcoholics and other more or less refractory patients. Not infrequently I spend four or five minutes with these patients in establishing an equilibrium of the gases in the tissues and smooth anesthesia before beginning the operation. The ordinary case does not require so much time, but, I believe, more time than many operators give.

In conclusion, I believe the users of gas-oxygen will derive great benefit in learning why and how patients respond, thus placing technic on a scientific basis, rather than considering it as an art, by buying some modern books and reading especially the chapters dealing with the physiology and pathology of the endocrines, metabolism, respiration, circulation, and the nervous systems. Recent years have brought out some valuable facts for us.

A member asked Dr. Teter what he would do in a case like the following: He was just about to prepare the nasal inhaler, when his patient fainted. He finally got her out of this state and again applied the nasal inhaler; she fainted the second time. He explained to her the safeness of this anesthetic. She said that she would try it the best she could. He covered her eyes with a napkin and, as he was getting ready to apply the inhaler, she fainted for the third time.

James R. Cameron, Philadelphia, Pennsylvania: I should like to have Dr. Teter, if he will, express his opinion on this question: When we obtain our state board license to practice dentistry, we are legally qualified to administer anesthetics, both local and general. However, should a patient die during the administration of the anesthetic, we are not permitted to sign the death certificate I think it is about time that we, as a profession, get busy along this line and assert our rights. Because we are present at the operation, we are naturally more prepared to state the cause of death than a physician called in after death.

Arthur E. Smith Los Angeles California: My experience has taught me that both block anesthesia and nitrous oxid-oxygen anesthesia should be employed and that they should be selected in accordance with the physical condition of the patient and the nature of the surgical operation. One should master the technic of employing both methods and employ them in the same manner as the physician selects his drugs in the treatment of various diseases.

E. W. Martindale, Columbus, Ohio: I want to emphasize the importance of a proper examination and a history of the case before anesthesia. We are then enabled to select our anesthetic agent and the time for giving it, having in mind the safety of the patient. We should give more attention to the welfare of our patients by careful examinations and recording of the conditions found prior to and at the time of giving the anesthetic.

We should not rely alone on one anesthetic agent. Let us determine which it should be, for we get our best results by being able to apply where they are best indicated.

Dr. Teter (closing): I do not wish to convey to you the idea that I am advising you to use one particular anesthetic in all cases. Not at all. I say, use either local or general, and use the anesthetic with which you are the most proficient. I would rather you would use only one, if you are quite proficient with that, than to use two or three, and not be skilled with any of them. I will predict, without fear of contradiction, that when you use one over and over again, less occasions will arise to use anything else. I do not mean, however, that there will not be times when it will be an advantage to use some other anesthetic.

Dr. Harms speaks of the use of pre-anesthetic narcotics. I use no pre-anesthetic narcotics in my extraction work. I do not say that there may not be an occasional case where it may be an advantage to use a little morphin, especially with those patients who have come to your office door time after time and who have not the nerve to come in. You would be doing a favor and a blessing to that patient to go out and catch him in the hall and give him a shot in the arm. That is an exceptional case, but in all my experience I have not given over half a dozen injections of morphin before an anesthetic in the office.

If the work is of a minor nature in the office, I do not need complete muscular relaxation. I have no difficulty at all in producing complete unconsciousness and quietness with my patients. The narcotic is given to aid and produce relaxation. When not using a narcotic, the patient recovers more quickly and is not in the office so long. In hospital work it is routine practice to give a pre-anesthetic narcotic.

I was not criticizing those who were giving private instruction courses in anesthetics or in oral surgery; neither was I criticizing those taking advantage of these courses, because, at the present time, that is the best they can receive, but I am opposed to it, because it takes the place of something better. I think that these courses should be given in our universities, and that they should be made worth while. They would be made worth while if they were more often selected

by the men who wish to take up this line of work.

Dr. Harms asked how I was governed about my poor risks in my office work. In hospital work we have our teamwork. Many other men see these patients before they come to me, and the risk is known before I see them. In office practice, you must be a good observer and diagnostician, and if you are skilled in the administration of nitrous oxid and oxygen, you will know whether you can safely administer it to the bad-risk cases.

Personally, I have never refused to administer nitrous oxid and oxygen to anyone who was able to come up in an elevator to my office. I do not mean by that that I have not had some bad cases. I would use my judgment in how long or how deep an anesthetic should be produced. My patients have been able to withstand what additional shock I would produce in giving them straight nitrous oxid and oxygen and not asphyxiating them.

I would be very careful in administering an anesthetic to a large, fat man, especially if he came into the office half intoxicated, unless I wanted my office torn to pieces; but I have done this a number of times and in these cases I have been convinced that you eliminate most of your trouble in administering an anesthetic by a quick induction—I mean by quick induction of the anesthetic, the quick elimination of consciousness. Then, after I have eliminated the patient's consciousness, I can take my time in establishing my equilibrium for that particular case and obtaining the proper degree of anesthesia. As Dr. McKesson has said, in establishing anesthesia and equilibrium, it may take four or five minutes in some of these extremely difficult cases, but it takes only from five to ten breaths to overcome consciousness if you are using straight nitrous oxid and are not allowing the patient to breath any air or oxygen. That answers Dr. Heidbrink's remarks. He does not agree with me in a quick induction, but it has been proved to me that it has eliminated entirely the excitement stage.

When I first started to give anesthetics, every once in a while I would have a patient in the office who would cause considerable disturbance during induction. I used to strap them down, but I never have to do that any more. When you have an excited patient you will have more trouble to obtain relaxation than you will if you can eliminate the stage of excitement. So I still say that you will eliminate most of your dangers by the use of a quick induction. I do not think that a quick induction produces a sensation of suffocation. Practically the same number of patients would tell you that they could not breathe freely if you were giving them pure oxygen under the same circumstances; this sensation is caused primarily by fear and apprehension and secondarily by obstruction to breathing caused by either partial closing of the nasal passages or too small openings between the bag and inhaler. These are the causes for the sensation of suffocation and not the portion of your nitrous oxid and oxygen at all.

In regard to the question raised as to what one should do with a patient who fainted when placed in the chair: After she fainted, if I had not done it before, I would have made an examination of the heart and lungs. If I found that they were in fair condition, I would have administered the anesthetic and taken out the teeth. I have had a number of patients start to faint in such cases and I always crowd my anesthetic. One should use more oxygen under these circumstances, but nitrous oxid is also a heart stimulant, and I have never had any difficulty. If I were not sure of my patient's condition and did not know whether the patient had some organic heart trouble or not, I would not give the anesthetic until I found this out. In this case, undoubtedly, her fainting was simply a psychic manifestation.

There is no question but what the state of affairs is not right, when we are legally qualified to administer an anesthetic, and we all have to say that it is fraught with a certain amount of danger and death. You see it on every hand, but still, according to the law of the land, we are not allowed to sign a death certificate. The conditions are opposed to each other. The law permits us to administer an anesthetic, and anybody who knows anything about the subject knows that you may have a death. If you do, as things now stand, it is compulsory for you to call in a physician to sign the death certificate. The same condition applies if a death should occur as the result of an oral surgical operation. I think that the time is ripe for the American Dental Association to take this up, and we already have proper legislative committees for this purpose.

SURGICAL SHOCK

By GEORGE W. CRILE, M.D., Cleveland, Ohio

(Read before the American Dental Association, Cleveland, Ohio, September 10-14, 1923)

FOR twenty-five years an intensive study of the nature, causation and treatment of surgical shock has been in progress in my laboratories and in the clinics of my associates and myself. Throughout this period our findings have been constantly analyzed by the results of the many investigators in the same field in this country and abroad. In this presentation it would be impossible to take the space that would be required for a comparison of our conclusions with those of others, or for a consideration of the relative merits of the various theories regarding the causation of shock which have been advanced. I shall, therefore, confine myself to a discussion of the phenomena of surgical shock, of the identity of surgical shock with exhaustion from any other cause, of the conception regarding the causation of shock which has been evolved from our researches and of methods of treatment of shock based on those conceptions, the validity of which has been established by the results of their application.

The man in acute shock or exhaustion is able to see danger, but lacks the normal muscular power to escape from it; his temperature may be subnormal, but he lacks the normal power to create heat; he understands words, but lacks the normal power of response. In other words, he is unable to transform potential into kinetic energy in the form of heat, motion and mental action, despite the fact that his vital organs are anatomically intact. His mental power fades to unconsciousness; his ability to create body heat is diminished until he approaches the state of the cold-blooded animal; the weakness of the voluntary muscles finally approaches that of sleep or anesthesia; the blood pressure falls to zero; most of the organs and tissues of the body lose their function.

These phenomena are the same whatever may be the cause of the shock or exhaustion. They apply not only to the man who has undergone excessive physical trauma on the battlefield, in a crushing accident in civilian life, or on the operating table, but also to the man in exhaustion from an overwhelming emotional stress, to the patient exhausted by long continued disease, to the person whom force of circumstances has kept awake continuously for many successive nights, and to the athlete who has made the utmost possible physical effort in a contest.

It is evident that in exhaustion from any cause, the organism has lost its self-mastery. Self-mastery is achieved only by the normal action of the master tissue—the brain. In exhaustion, then, is the brain primarily exhausted, or has some other tissue or organ functionally broken down, and has that breakdown carried with it exhaustion of the brain? If the latter is the case, then what organs and tissues are vitally necessary to the brain for the performance of its function? Obviously, the exhaustion of any organ or tissue not vital to the performance of brain function need not be considered, since it probably would not be a direct cause of acute exhaustion.

In our attempt to answer these questions, our studies have included obser-

vations of the variations in blood pressure; histologic studies of various organs and tissues of animals in exhaustion; investigations of the hydrogen-ion concentration of the blood; estimations of the alkali reserve; measurements of the electric conductivity of various organs and tissues, and the direct measurement of variations in the temperature of the brain and the liver. By these various methods both the immediate and the late effects of exhaustion have been studied.

Our findings have led us to the conception that the organism is an electro-chemical mechanism constructed on the pattern of its constituent cells; that the operations of life are carried on by means of a difference in potential between a part of highest potential, the brain and central nervous system, and a part of lowest potential, the liver; that since all cells of the body are immersed in fluids which are rich in electrolytes, it is by means of those fluids and the nerves that the circuit between the point of highest potential, the brain, and that of lowest potential, the liver, is completed.

According to this conception, when the oxidation in the brain is increased by psychic, traumatic or chemical excitation, the electricity produced by the increased oxidation passes from the brain along the nerves to the areas of lower potential in the muscles and glands and finally to the point of lowest potential, the liver, returning to the brain via the electrolytic solutions in which the system is immersed.

The conception that man is an electro-chemical mechanism supplies an interpretation of the principal phenomena of quiescence, stimulation and exhaustion which constitute normal life; it supplies a new basis for the analysis of pathologic phenomena.

In accordance with this conception, exhaustion is the result of a diminution of the difference of potential between the poles of the organism, due to a decrease in the brain which, in turn, results from a decreased difference in the potential in its constituent cells. This conception explains the identity of the phenomena of exhaustion and the progressive degrees of exhaustion to "shock." When the difference in potential reaches zero, the organism is dead.

Since the electro-chemical theory identifies the organs whose integrity is essential to the efficient operation of the mechanism, it should indicate the means by which those organs may be safeguarded against the processes of disease and injury; it should determine the most efficient means of supplying the essential elements of the cells—water and oxygen; it should emphasize the paramount necessity of rest and sleep; it should indicate the need of aiding failing organs by the administration of their essential products; it should direct the selection and gage the safe application of anesthetics; it should determine the selective application of drugs; it should guide the hand of the surgeon; it should lead the clinician to protect his patient against the excessive driving of environmental as well as of internal stimuli.

For the past two years the treatment of the patients in our clinic has been based on this conception that the difference in potential between the nucleus and cytoplasm of the cells as well as between the essential organs of the electro-chemical system must be maintained; and in accordance therewith we have adopted the following main principles as our guide in the protection and restoration of our patients:

1. The organism needs an abundant supply of fresh water.
2. An abundant supply of oxygen must be delivered to the cells.
3. The permeability of the selective semipermeable membranes must be maintained within a normal range.
4. Both the local and the general temperature of the body must be kept at or near the normal.
5. An abundance of mental and physical rest and an abundance of sleep are essential.

6. The physical structure of the cells must not be impaired by the indirect effects of the trauma of the operation nor by the anesthetic.

By the practical application of these principles, the two essential factors in the maintenance of the integrity of the electro-chemical system are assured, provided recovery is anatomically possible and the disintegration of the cells has not progressed to the early stages of inevitable dissolution; that is, provided the acid-alkali balance—the difference of potential—within the cells is maintained or restored, and their internal respiration is protected.

Every patient is given the benefit of the application of these principles, modified only by the nature of the disease processes in the individual case.

While the treatment of each patient is individualized, nevertheless, the employment of the protective measures we shall describe has become practically a routine; for in all cases, and pre-eminently in the case of the "bad-risk" patient, the management is based on *possibility* and directed by *probability*, not by the physical state of the individual patient at the moment. This conception is comparable to the principles of preventive medicine. That is, in the case of the bad-risk patient we do *in advance* of exhaustion or shock all that we would do should these develop.

The practical application of the principles cited above is achieved by the following measures: In bad-risk cases, nitrous oxid-oxygen *analgesia* (not anesthesia) with local anesthesia is employed to avoid further interference with the already impaired internal respiration of the cells. The trauma of the operation is divided. In case of hyperthyroidism, if the operation produces an exacerbation of the symptoms, the operation is stopped at any point and the wound packed open with flavine or sterile gauze, closure being deferred until it is warranted by the condition of the patient. Water is urged by every route and, to ensure the readiest possible hydration of the cells, 3,000 cc. is routinely given, daily, by hypodermoclysis by Bartlett's method. Oxygenation of the cells is promoted by the transfusion of whole blood before operation, during operation, and after operation, according to the indication. To assure the maintenance of an adequate circulation, which is essential to the supply of water and oxygen to the cells, digitalis is administered routinely in those cases in which the myocardium is impaired, a condition most commonly seen in cases of hyperthyroidism. Rest and sleep are promoted by control of the environment and by narcotics, excepting in the presence of an already depressed liver function, as in jaundice, for the function of both the brain and the liver is depressed by narcotics, especially by morphin. In abdominal cases, moist hot packs are applied immediately after operation for the support of the liver cells. The environment of the patient is controlled from the moment of his entrance to his exit from the hospital.

With the gradual extension of the application of these measures based on the electro-chemical conception, the mortality rate of every type of case has been diminished, and the operability has been extended until now no case is considered inoperable unless the stage of final dissolution is initiated.

The efficiency of any surgical method must be judged by its effects on (a) the postoperative mortality, and (b) the postoperative morbidity. Testimony regarding the second of these points is primarily subjective and is not amenable to statistical compilations. While figures regarding the postoperative mortality demand analysis as to their relation to the various degrees of exhaustion in each patient, in the mass and over periods of years, their indications are of positive value. For that reason, there are included here the following mortality statistics of operations performed during the postwar period, since it was the vast experience gained in war service, not

only in personal observations of wounded and exhausted soldiers, but also, and of inestimable value, in conferences and interchange of opinions with my colleagues which has guided the later researches and the formulation of the principles in accordance with which our surgical patients are managed.

During the period from the beginning of 1919 to June, 1923, the mortality rate of the surgical service at Lakeside Hospital has fallen from 2.4 to 1.3 per cent; the mortality rate of 1,090 thyroidectomies has been 1.8 per cent, of the last 230 of these, 0.8 per cent; the mortality rate of the last 1,322 ligations has been 0.6 per cent, and a series in progress, June 21, 1923, included 466 consecutive operations for exophthalmic goiter without a death.

Summary

1. In accordance with our conception, shock or exhaustion from any cause is the result of the failure of an essential part of the electro-chemical mechanism which renders impossible the maintenance of the essential difference of potential within the mechanism.

2. In accordance with this conception, the prevention of shock demands the application of such measures as will maintain this difference of potential.

3. The treatment of shock demands the application of such measures as will restore this difference of potential.

Discussion

Truman W. Brophy, Chicago, Illinois: Dr. Crile's paper is a classic. It is the culmination of prolonged, intense effort on the part of the distinguished author and his co-laborers in laboratory and operating-room investigations and bedside observations.

The principles he sets forth must be either accepted or denied. No one can deny them unless he has passed through a like experience, has studied the same problems, has a like understanding of the subject and has obtained results not in accord with his statements. Doctor Crile long ago recognized the importance of the study of shock from every conceivable point of view. He brought to his aid the work of the anatomic, physiologic, chemical and pathologic laboratories and used the results in connection with his vast clinical experience. He has made use of every line of thought bearing on this subject, and his observations have been based on the grounds of a practical experience which has been unusually large.

The phenomena of shock, whether emotional from accidental trauma, or surgical, are recognized by all. Dr. Crile states: "Our findings have led us to the conception that the organism is an electro-chemical mechanism constructed on the pattern of its constituent cells."

My experience has been principally in the surgical treatment of children. Several years ago, when the question of shock was under discussion in London, I took the position that shock is less severe following operation on a patient under 3 months of age than it would be between 12 and 18 months or later, for the reason that the nervous system of a young child is not well developed, and it is not, therefore, capable of receiving the same impressions that it would later in life. Moreover, all mental apprehension is eliminated, and we all know that alarm and dread are among the most powerful factors in producing shock. This statement was challenged by a distinguished English surgeon. His remarks on the subject, however, were not convincing. To determine whether the position I had taken was in accord with the best authorities in America, I consulted twenty-eight eminent physiologists, anatomists and surgeons throughout the United States, all of whom, with one exception, agreed with me. The answer I received from Dr. Crile I am glad to quote here. He stated: "I am sure you are right. The neuron arcs are not completed at that time and, in a way, the operation is comparable to one under anoci-association." The position that I took in London and have constantly maintained—based on clinical experience, without a knowledge of the extensive investigations of Dr. Crile—was exactly in accord with his findings.

The essence of the splendid paper we have listened to is, I believe, in these words: "For the past two years the treatment of the patients in our clinic has been based on this conception that the difference in potential between the nucleus and cytoplasm of the cells as well as between the essential organs of the electro-chemical system must be maintained."

The six principles laid down for the protection and restoration of patients are of the first importance. "The organism needs an abundant supply of fresh water." It is quite evident that this one principle has not been dwelt on with due emphasis in the schools of medicine. Young men often express surprise when I direct the nurse to give the child as much water as it wishes to within four hours of operation, and, following operation and the

passing of the anesthetic, to give the patient water. The whole system appeals for water—abundant water—and water should be given. The maintenance of normal temperature, the supplying of oxygen, and the securing of plenty of mental and physical rest cannot be too strongly emphasized.

I wish to interject here mention of a routine procedure which I have adopted the last few years in the prevention of shock. The first consideration is the general condition of the patient. This is especially true in operations on young children. Acidosis, when it exists, should be corrected, as a child in this condition tolerates an anesthetic poorly. I am sure that fatal results are sometimes due to administering anesthetics to acidosis patients. As Dr. Crile says, the acid-alkali balance, the difference in potential, within the cells should be maintained. A study of the thymus gland is included in this routine preparation of the patient, and this I regard as of great importance. We know that status-thymico-lymphaticus is a serious menace to surgical procedure in young children and often productive of shock during and following anesthesia. As a precaution against surgical shock in infants, I have adopted the measure of making a roentgenogram of the child's chest so as to determine whether the thymus is of normal size. This picture, with percussion of the chest, gives conclusive evidence of the condition. If the gland is enlarged, operation should be deferred. Often one treatment of the roentgen ray will be sufficient to reduce the gland to normal size, after which the operation may be made, usually within six weeks. I am satisfied that the mortality following operations on children has been decreased by reason of the fact that these precautions have been observed. Up to the year 1915, the mortality of my operations for cleft palate on patients of all ages was 9.20; from 1915 to 1921, the percentage was 1.80 in 5,422 operations on cleft palate. This most happy result has been due, I am sure, to a better understanding of the general condition of the patient, and to the preparatory care and the postoperative treatment, all of which has been in a great measure in accord with the principles outlined by Dr. Crile.

Dr. Crile reports that "during the period from the beginning of 1916 to June, 1923, the mortality rate of the surgical service at Lakeside Hospital has fallen from 2.4 to 1.3 per cent; the mortality rate of 1,090 thyroidectomies has been 1.8 per cent; the mortality rate of the last 1,322 ligations has been 0.6 per cent, and a series in progress, June 21, 1923, included 466 consecutive operations for exophthalmic goiter without a death"—a record on which we congratulate him.

We have listened to a masterpiece in surgical literature by one of America's most distinguished surgeons. What he has stated is applicable as well to the work of the dental and oral surgeon. The exodontist who encounters shock in the administration of anesthetics and in his operations will appreciate the value of the principles given in this paper, if he observes them. The dental practitioner must be impressed by Dr. Crile's statement that whenever an anesthetic is employed, either local or general, a careful survey should be made of the patient's condition with a view to deciding as to the expediency of its use.

The great lesson taught by this paper is conservatism and preparedness. Conservatism means the exercise of the very best judgment of the operator, and, if need be, the cooperation of an expert diagnostician. Act only after careful deliberation—your own judgment plus the judgment of an expert in pathology.

Don M. Graham, Detroit, Michigan: Dr. Crile's early studies and findings were a great contribution to dentistry in popularizing nitrous oxid-oxygen, and more particularly local anesthesia. He was able to show that the largest factor in surgical shock was trauma, and that the central nervous system, especially the brain, is one of the major factors in circulatory failure. If afferent impulses can be prevented from reaching the brain cells, no shock will supervene from trauma; hence the great advantage of local anesthesia. It is not enough that the patient be properly narcotized to prevent central disturbances and shock, as shown by depressing effects following administrations of ether, if tissues be traumatized. Even nitrous oxid, unless used in proper proportion with oxygen, can likewise cause exhaustion. In the proportions that nitrous oxid and oxygen are ordinarily used, 10:1, blood pressure will fall quite as rapidly as with ether anesthesia. Only with higher concentration of oxygen can the pressure be maintained.

Dr. Crile's conception that man is an "electro-chemical mechanism" probably offers a better working conception of exhaustion than any yet advanced. The attempt to explain the various degrees of exhaustion and shock to cessation of life is, indeed, an attempt to explain life itself—truly an ambitious undertaking. The electro-chemical theory will probably remain for some time the best working hypothesis by means of which the physician and surgeon may better equip themselves in dealing with these conditions. The electro-chemical theory, according to its author, is all embracing. It admits of curative as well as prophylactic measures. It covers the whole range of the healing art. It applies to dentistry as well as to medicine. It admits of scientific investigations and their practical

application to all phases of surgical and medical practice as well as preventive medicine.

If the electro-chemical theory be incomprehensible to most of us, the basic principles envolved for the well-being of the patient seem simplicity itself. Furnishing an abundant supply of fresh water to the tissue cells would seem to be an easy matter, but in actuality not so easy of attainment. Supplying an abundance of oxygen to the cells would seem easy, but withal not always possible. Conserving normal body temperature is considered by all to be essential to the maintenance of health, but, under certain conditions, not so easy of accomplishment. It is for our scientific investigators to discover the best means and methods of attaining these various ends.

Dr. Crile's management of the "bad-risk" patient could be extended to all patients making the procedure truly prophylactic in every case. It is not possible for the average operator to know definitely that a patient will not pass into the "bad-risk" class regardless of symptoms presented, and the admonition to do in advance of exhaustion or shock what we would do should those develop is as scientific as it is common sense.

It has been my practice for several years to follow out this injunction to the very great benefit of the patient and the peace of mind of the operator. The practice of having a cabinet full of restoratives on hand for an emergency avails little in many cases when shock has already ensued.

For several years only local anesthesia has been used, except in certain hospital cases. Our early experience with this anesthetic was not uniformly satisfactory. It was noted that a good many cases showed depression and occasionally collapsed when they presented just before meal time or in a hurried or somewhat exhausted condition. It has become a common custom for patients to come for an extraction or some other oral operation omitting a previous meal, in which case we found a certain percentage showing some depression. In a comparison of a large number of cases, it was found that the patients stood the local anesthetic much better after a comfortable meal, or rather behaved less satisfactorily on an empty stomach. For some time we have made it a practice of advising patients to eat comfortably and regularly before coming for an operation, and if this appointment is within the meal hour, we always give the patient a substantial meal of malted milk. To be sure, this procedure cannot be followed by a general anesthetic. A few minutes before an injection is made, it is our routine practice with all patients to give from 10 to 15 mg. of aromatic spirits of ammonia. Hot coffee was tried, but proved inferior to aromatic ammonia or hot malted milk.

Since much of our work is done for the debilitated, appropriate measures have been adopted, and it is some satisfaction to know that we have been carrying out rather faithfully one of Dr. Crile's injunctions, that of doing in advance of exhaustion all that we would do should evidence of shock develop. Besides the routine measures described above, we take special measures with the individual patient. Where the myocardium is involved, we digitalize our patient, if he is not already so treated, first, to ascertain the myocardial reserve, which is rather uniformly indicated by the heart's reaction to it, and secondly, to place the myocardium in the best possible condition to withstand the strain. Where we have fibrillation, an admixture of small doses of quinin sulphate every third day seems to us to steady the heart.

In cases of diabetes, we have lately had patients undertake a few treatments of insulin, with, we believe, very good results. In cases of abnormally low blood pressure without any evident organic lesion, we have added epinephrin, but without uniformly good results. Indeed, our tendency has been to cut out, or rather cut down, the epinephrin content in all our local anesthesia, regardless of the fact that theoretically, at least, it is many times indicated, and that some investigators highly recommend it.

Where we have an advanced pathologic condition of either cardiac or renal origin, only a minimum amount of surgery is attempted at one time, and where evidences of heart block is present, only such manipulations as would afford local comfort are undertaken for fear of metastases quite as much as shock.

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T. A. Hardgrove, Fond du lac, Wisconsin: Back in Wisconsin where I come from we wait eagerly from time to time for messages from Dr. Crile, and we are never disappointed. I know of no paper ever read before a dental society that has been of as much value as this one today. Take, for instance, the subject of

the safety of the nerve block alone: when he elaborates on the cell theory and shows you why it is a method of safety, it removes at once quite a great deal of worry among men starting in with the use of block anesthesia.

Dr. Smith has told you for a number of years that it was a safe and sound method to use, but not until today did we know exactly the chemistry and the electrical principles involved in the theory. Dr. Crile has shown you that as you disturb the chemistry of the cell, in that degree you produce shock.

J. P. Henahan, Cleveland, Ohio: I am going to ask Dr. Crile, in closing his discussion, that he refer to his method of preoperative treatment for the quieting of his patients—the quieting of their fear—in that way eliminating their fear from shock.

Dr. Crile, (closing): I think perhaps I should apologize for having introduced into my paper a partial statement of the electrochemical theory, but the truth of the matter is that we have worked in accordance with it for so long that we have almost forgotten that the details have not been generally known.

I might mention a fact or two which will help you to see more clearly what we are aiming at. If what I said is true, then we should find that all the cells of the body are condensers and have the capacity of storing electricity. The head of our research department, who is a very brilliant physicist, in whose work we have entire confidence, has shown that all cells have a high order of electric capacity. For instance, the cells of the brain or liver in man and animals have a capacity per unit of surface at least one thousand times greater than the capacity of the most successful condenser made—the air condenser of the wireless. This high capacity is due to the exceeding thinness of the cell membrane. The thinner the film, the greater the capacity. A calculation of the combined surfaces of all the millions of cells in the brain shows what an enormous electric capacity there is in that organ alone.

Now, as to the practical application of this theory, it is most strikingly shown in our experience with patients with hyperthyroidism, of whom formerly large numbers were lost, so that I wondered why confidence in operating for exophthalmic goiter was not lost. I dare say it was in some cases.

We were driven to extreme measures for the protection of these patients. At one time we had a patient who had the very high temperature of 114; he had had hyperthyroidism years before. When this patient came to the operating room, his temperature took a sudden jump and he seemed to be filled with fear. He died shortly afterward. I said then that I would never again proceed with an operation if the patient came to the operating room in that state.

Another patient came to the operating room in a state of great excitation. We sent her back to her room, for I said I would not operate on a patient in that condition. She died that night with a temperature of 109. That was a purely emotional death, for we had not touched the patient at all.

Then we said that now we have it—anesthetize these patients in their beds and then carry them to the operating room. We did so, and our mortality rate was at once lowered, but still we lost many cases. We then said that if a patient under anesthesia came to the operating room with nausea and other signs of general disturbance, we would send that patient back and operate on him another day. But we still found that some patients died without any operation at all. We found that all anesthetics cut down very greatly the factor of safety. It followed that since we could not take the patient to the operating room without anesthesia, and since we could not take them to the operating room under anesthesia, the operation must be performed in the patient's room and the anesthesia must not progress beyond the stage of analgesia.

We found that if during the operation we did not use a local anesthetic, the pulse rate increased rapidly during the operation, but, with the block, the pulse rate was unchanged; so at the present time, when we have a very sick patient, we do not move his head from his pillow. We organize the service so that we can operate easily in the patient's room. That applies not only to cases of hyperthyroidism, but it applies also to other types of cases.

I want to call attention to the fact that morphin is a specific antagonist to the emotions. You remember, probably, that in the days of the French Revolution, French citizens about to be beheaded took large doses of opium and approached execution with indifference.

We should not forget that the human mechanism is a mechanism of the most wonderful capacity for reaction. It is a mechanism in which the most trivial apparent excitation of the senses—hearing, sight, touch, taste and smell—may produce most powerful responses, and therefore I think we cannot use our knowledge too carefully; we cannot protect our patients with too great care in the course of our surgical operations.

A CONSIDERATION OF DENTAL NOMENCLATURE WITH SPECIAL REFERENCE TO PERIODONTAL NOMENCLATURE

By JOHN OPPIE McCALL, A.B., D.D.S., F.A.A.P., Buffalo, New York

(Read before the Dental Editors Club, Cleveland, Ohio, September 8, 1923)

SO unusual is the honor and opportunity accorded me of presenting a paper before this society, that I cannot but preface this essay with a formal, but none the less sincere, expression of appreciation. In your hands to a large extent lies the development of the literature of dentistry. And through this literature of our profession, its scientific development is aided and the dissemination of knowledge is accomplished.

Should this presentation of the subject of periodontal etiology impress you favorably, it means in a word the adoption, by both medical and dental professions, of those terms and definitions which you may approve.

A correct nomenclature is essential in the development of any science. Just as language itself is important for the transmission of ideas, information, etc., from one person to another, so is an exact nomenclature important for the accurate dissemination of ideas bearing on any cultural or scientific subject. Workers in any field of science must speak the same language, and each must know the exact meaning which the words of the other convey, or confusion instead of advancement will be the result. But not only must the nomenclature in each field of science be accurate and intelligible to the workers in that field, it must, if it is to be considered entirely satisfactory, be equally intelligible and must convey the same ideas to workers in other fields of science. It is also desirable that it be intelligible to educated people even though they may not be scientists.

These latter considerations form the basis for the usage inaugurated with the birth of the study of science; viz, the coining of scientific terms from roots taken from the Greek and Latin. These so-called dead languages live in our scientific terminology and even in our everyday speech, and because their roots are found in practically all scientific terms the world over, the translation of scientific works into different languages is much simplified. I think it will be generally conceded, then, that we should continue as far as possible to found our terminology on the Latin and Greek languages. It is desirable that we should utilize one to the exclusion of the other in any given field of science. In latter-day pathology, we find a definite trend toward the use of the Greek roots. With this as a basis, and because the Greek tongue is richer in terms which we can appropriate for our uses, we have chosen to utilize Greek roots for the newer terms

which we present in the field of periodontology. Earlier usage in dentistry and in medicine as well, inclined largely to words of Latin derivations. And since many of these roots are firmly entrenched in our literature, we occasionally find it necessary, or at least advisable, to combine roots from the two languages in one word or term. To the purist this may be anathema, but in a period of transition, so to speak, it may be almost inevitable and therefore excusable.

I have just suggested that we are in a period of transition. This is true as regards the gradual change from the older use of Latin roots to a very common employment of Greek roots in the newer terms. We are also in a period of transition as regards our scientific development. This sort of transition is simply an expression of that never-ending struggle toward perfection in our work, which always has gone on and always will go on. With the acquisition of new knowledge, older accepted ideas are often seen to be erroneous. This constant development and change in the field of science must be paralleled by a corresponding change in nomenclature. I therefore come before you with new terms which express new concepts of periodontal science. But I come not as an iconoclast who would tear down structures that you revere, for the mere sake of tearing down. Neither do I present these terms with the assertion that they represent a permanent acquisition to our literature. If the hypotheses which lie back of these terms are found to be correct, as tested by the investigators of today and tomorrow, these terms will stand and will need no champion. If these hypotheses are found to be only a step toward the final solution of the problems of periodontia, these terms will in time be superceded by others more suitable. But they will at least have served a purpose, in that they will enable the periodontist of today to address his audience with the certainty that he is conveying the thoughts which it is his desire to put forth.

The study of dental literature from the standpoint of nomenclature is very interesting. It is to be expected that a profession which suffered an unwilling divorce from the profession of medicine and which was thereby stimulated to such a remarkable development along mechanical lines should have developed a nomenclature rich in the terms of the workshop, along with the terms of the scientific laboratory. The mechanical and scientific have often overlapped and the effort to devise suitable terms expressive of pathological conditions to replace older terms which have been found open to criticism has been difficult. This effort itself has been criticized by the unthinking, who fail to realize that science cannot stand still, but must advance. As one example of the difficulty encountered, I may cite the word *pocket*. It is used, often joined with the word *pus (pus-pocket)*, to designate the lesion formed when the tissues immediately investing the tooth root lose their continuity as the result of parietal periodontal disease. There seem to have been no pockets in ancient Greece or Rome, in the sense in which we use the word in everyday life. Pouches, they had, and sacs, and various other hollow receptacles. But none of these terms, as found in the Greek and Latin quite fit the lesion we wish to describe. Moreover, such terms as might be stretched to cover this lesion have already been appropriated by anatomists and pathologists, and have acquired meanings which still farther remove them from the field of periodontal possibilities. So we have found ourselves forced back on the homely but, to us, descriptive word *pocket*. We can only hope that

the scientists of the future will not revert to more primitive modes of dress and forget what pockets are.

A difficulty of a somewhat different nature is encountered when we propose to coin a word which shall, under one roof, so to speak, contain a complete description of the disease or the mechanical process or what not, and shall state its location. This means that all dental terms should contain the root *dent, or odont* according to which of the two parent languages is to be drawn upon. This procedure has the merit of leaving no doubt in the mind of the non-dental scientist who may happen to see the word as to its anatomical relationship. For instance the word *prosthodontist* is one coined after this plan. The word *prosthetist* means quite as much perhaps in the proper context, but no one could accuse a prosthodontist of making artificial limbs, while the title *prosthetist* could properly be applied to one who makes artificial substitutes for any part of the anatomy. Moreover, having accepted *orthodontia,* and with sufficient etymological justification, we seem to be within safe bounds in accepting *prosthodontia* and other words similarly coined. If the words *prosthetist* and *prosthesis* are to be used, they should be linked with the adjective dental, or so used that this qualification is unmistakably indicated.

In this connection, mention should be made of the word *prothesis* which was at one time suggested as possibly being more acceptable than *prosthesis.* The argument was put forth without sufficient inquiry into the meaning of the original Greek words. It happens that in the Greek the prefixes *pro* and *pros* both occur and both are used in conjunction with the verb *tithemi.* Study of the two words thus formed indicates clearly that one formed with the prefix *pros* is the more applicable for our purpose since this prefix means *in* or *upon,* while *pro* means *before.* In other words, we place artificial substitutes *in* our patients' mouths, not *before* them. There is ground for criticism of the word *prosthodontia* and *prosthodontist* because of the elision of the letter *e* of the Greek verb root. This omission is, I believe, justified from the standpoint of euphony.

Passing now to another odontia, viz., *periodontia,* we find here a word derived from a noun which has a place in the medical dictionary. This word is *periodontium,* and it indicates the tissues surrounding the tooth root. Because it has been somewhat loosely defined in the past, and because it seemed so admirably adapted to meet the demand for a word which could be used to designate collectively the three tissues which invest the roots of the teeth, this word *periodontium* was awakened from its slumbers in the pages of the dictionary and put into the living literature of our day. It may be urged that the broadening of this word to include alveolar bone and gingival tissue as well as pericementum is somewhat arbitrary. Let me only remind you that usage governs the meaning or application of a word, and this may go so far as actually to reverse its original meaning. If we grant the desirability of having in our literature a collective noun which shall designate this group of three dissimilar tissues, the eligibility of the word *periodontium* becomes at once apparent, and it requires only its usage in this sense to insure its acceptance. Parenthetically let me suggest to dental and medical writers that they use the word *pericementum* in preference to *periodontal membrane,* which has lately appeared in dental writings. This term will cause confusion, if we are to use *periodontium* in the broad sense just proposed. From

the basic word periodontium we derive very easily the adjective *periodontal;* the noun *periodontology,* which signifies the science and study of periodontal disease; the noun *periodontia,* signifying the practice of treating periodontal disease; and the noun *periodontist,* he who practices periodontia.

Having raised the question as to whether such a collective noun as *periodontium* is a desideratum, let me support the anticipated affirmative by citing the well-known fact that the three tissues referred to are often coincidental sufferers from a very common and often disastrous disease complex. Just as it is desirable to have a name which shall designate collectively the three tissues surrounding the tooth root, so also is it desirable to have a single word which may be used to denote collectively the various diseases which in varying combination attack these tissues. The term pyorrhea alveolaris has occurred in our literature for many years and still remains in spite of increasing protest on the part of all students of the subject. Its unsuitability lies in part in the limitations imposed by the term itself. Even assuming that pus flows from the alveolar bone, a thing which rarely occurs, the term still fails to designate disease conditions of the periodontium in which there is no pus formed. Such disease conditions are by that very fact overlooked, or considered unimportant by the practitioner who is looking for a true *pyorrhea.* For the sake of assisting our confréres to get a truer insight into the nature and importance of the diseases of the periodontium, we need a word to designate them which shall be broad enough to cover all diseases which attack any or all of the three periodontal tissues. Such a term is *periodontoclasia* a word proposed by McDonagh and adopted by the American Academy of Periodontology about ten years ago. The suffix *clasia* is derived from the Greek verb *klado*—meaning, "I break down." The word periodontoclasia, then, means, a breaking down of the tissues surrounding the tooth. This word has been criticized on the ground that not all of the disease conditions which it is intended to cover are actually destructive. It is true that we may have an atrophy, an hyperplasia, or a metaplasia in the periodontium, and it is a fact that at the time when such a pathologic process is going on, there is no actual breaking down of tissue. All students are agreed, however, that the diseases of the periodontium are progressive in character, and it is doubtful if any of the processes just mentioned can be carried on for even a short time without an actual loss of tissue elements taking place. Since we may, in addition to the above, have a destructive process which is not even inflammatory in character, as shown by Box, it will be seen that we cannot use the word periodontitis as a collective term. Until some better word appears then, let me urge upon you the word *periodontoclasia* as a generic term under which we may specify certain types and stages of the diseases of the periodontium by other more limited terms. The term *dental periclasia* has been suggested as a synonym for periodontoclasia, or in a suitable context, the word periclasia alone. As a variant for the sake of euphony, this term seems suitable.

Study of periodontal disease discloses the fact that we find disease attacking the gingiva, pericementum and alveolar process either singly or in combination. Also we find that the gingiva itself may be attacked in different locations according to the nature of the disease process. We therefore propose the division of the gingivae into marginal and cemental. The *marginal gingiva* is that portion of

the gingival tissue which is not directly attached to the tooth. It normally is in contact with the enamel, and forms by its apposition with the enamel the *gingival crevice.* The *cemental gingiva* is that portion of the gingiva which is attached directly to the cementum. It ends at about the level of the alveolar crest. The marginal gingiva may be the site of disease without appreciable involvement of the cemental gingiva. The cemental gingiva, on the other hand, is the tissue in which pocket formation starts. It also is frequently involved before the marginal gingiva in inflammatory processes. This division of the gingiva is therefore justified on pathologic and anatomic grounds. The term *gingival crevice* has seemed more suitable than *subgingival space,* since normally there is no space between the marginal gingiva and the tooth. Moreover the prefix *sub* is unnecessary, and even if used would imply a location farther down upon the tooth root. This brings us naturally, also, to *crevicular* as an adjective, used in referring to the gingival crevice or structures constituting it.

To the students of all phases of dental science, those surfaces of the teeth which approximate each other present important problems. For a long time they have been called the *proximal* surfaces. But the medical dictionary defines *proximal* as "nearest the median line; opposed to distal." The correct term is approximal. Attention has been called to this by Ottolengui, and need not be repeated here except as it has a bearing on another word which seems less correct although it appears in the medical dictionary, viz., *interproximal.* It would seem that this word should be *interapproximal.* As applied to structures situated between approximating or adjoining surfaces, the word *interdental* seems more suitable and certainly more euphonious than *interapproximal.* Thus we have *interdental papilla,* the portion of the marginal gingiva which lies between adjoining teeth. The term *interdental splint* at once comes to mind in apparent controversion of the foregoing suggestion. It is apparent that splints may be interdental, in the above sense of the word, or intermaxillary, as when placed to afford intermaxillary support.

Since the word periodontium has been adopted by periodontists as referring to all the investing tissues of the teeth, it follows that the word periodontoclasia should apply to any process which destroys or breaks down any of these tissues. We may therefore in the broadest sense utilize it to refer to periapical disease, as well as to the types of disease which arise along the side of the root. That this has a sound basis in pathology is evident from the fact that either type may progress toward and merge into the other. We therefore require an adjective to designate lesions originating along the side of the root as distinguished from lesions at the apex. The word *lateral* has been suggested, but as this word is so commonly associated with an individual tooth, it would seem less confusing to use another word. For this word *parietal* is suggested. It is derived from the Latin *paries* meaning side wall. We thus can distinguish between parietal and periapical lesions.

Periodontists have been more interested in the parietal lesions than in the periapical, and for this reason I have no suggestion to make regarding the nomenclature of periapical lesions. With regard to the parietal lesions we have felt it necessary to introduce some new terms, because our studies have indicated to us that a greater diversity of lesions is to be found in this group than

has commonly been supposed. And in order that these types might be intelligently studied and discussed, suitable names must be found for them. It is beside the point that all of these forms of disease, unless checked, tend to end in one arch destroyer. For it is only through the diagnosis of the remarkably diversified early lesions that the members of the dental profession may render their patients proper service in this field. Stated in another way, patients who consult a dentist at regular intervals should never develop a pus pocket or a loose tooth. Needless to say, this result is only to be attained by the dentist who is familiar with incipient parietal lesions and their treatment.

One of the common incipient lesions which is clinically observable is a wasting away of the marginal and cemental gingiva, with a resulting exposure of the cementum. This may occur without visible signs of inflammation, and may be either a true atrophy or a process exhibiting only microscopic evidence of inflammation. To this we have given a name found in the medical dictionary; viz, *ulatrophia;* this should preferably be anglicized to *ulatrophy*. Since this term is applied only to those cases in which the clinical signs of inflammation are lacking and in which it is thus impossible to distinguish between atrophy and mild inflammation, ulatrophy seems an acceptable term by which we may designate this very important early lesion.

When a lesion occurs which exhibits a visible redness of the gingival tissue, we are safe in assuming that it indicates a state of inflammation, and therefore designate it a *gingivitis*. This word has been in use in our literature for many years and needs no extended comment. It may be noted, however, that gingivitis may occur alone or combined with other deeper lesions. Diagnosis demands, of course, that the presence or absence of other lesions be noted.

There are several types of gingivitis requiring mention from the standpoint of nomenclature. Let us first mention that type caused by infection with the Vincent spirochete and fusiform bacillus. This type has been given many names of varying suitability. Since there is a preference on the part of some pathologists to avoid using the names of individuals in scientific nomenclature, we rule out Vincent's infection or gingivitis, which would otherwise be so acceptable. Since one of the striking characteristics of this type is the rapidly spreading ulcer, it seems eminently proper to call it *phagedenic gingivitis,* the word *phagedena* meaning rapidly spreading ulcer.

The other types of gingivitis can be designated by terms which have been in use in the past, such as, *acute, chronic, hypertrophic,* etc.

In the past but little attention has been paid to bone resorption in parietal disease except as it has occurred in the course of pus-pocket formation. To the careful observer, however, many teeth which have no pus pockets may be found to have perceptible mobility, a state of affairs only explainable on the basis of resorption of bone from the inner wall of the alveolar process. Alveolar crest resorption, on the other hand, is a necessary forerunner to the wasting away of the marginal gingiva which we have already designated as ulatrophy. Either or both of these bone changes may take place without presenting evidence of inflammation .either clinically or microscopically. This latter point has but recently been brought out by Box. This is a type of periodontal disease which deserves a name by which it may be designated both in study and in diagnosis. The process may exhibit loss of both cells and intercellular substance

or loss of lime salts alone. And since these destructive processes are indistinguishable clinically and only to be differentiated with certainty under the microscope, the term *alveoloclasia* seems acceptable as a designation for either or both types of alveolar resorption. It does not contain the derivative *odont* or *dent,* hence should be used with the adjective *dental* if we wish to specify its location. Its derivation from the Latin *alveolus* and Greek *clasia* produces what is often called a hybrid word, a thing which we should avoid if feasible. Having chosen the suffix *clasia* for the generic word periodontoclasia, we, however feel it better to retain it here, especially as the Latin fails to furnish us with a satisfactory substitute.

With the next phase of periodontal disease we come to that type which has aroused the word-coining efforts of many authors. Failure to understand the pathology of this type, which is characterized by the formation of a pocket along the side of the root, is responsible for the many errors in nomenclature in this field. There is an involvement of all these tissues of the periodontium, but to me it has seemed that the striking feature, especially from the clinical standpoint, was the destruction of the pericementum. I have therefore designated this type as a *pericementoclasia,* recognizing, however, the failure of this term to specify other important features of the pathologic process. Box has recently proposed the term *periodontitis* for the pocket forming type of periodontal disease, and there is much to be said for this term. The disease process specified is always inflammatory, hence the suitability of the suffix *itis.* And since the inflammation involves all three periodontal tissues, the term seems more suitable than those which seem to limit the location of the disorder to one tissue. I will only urge for the word *pericementoclasia* that it designates a definite breaking down of tissue, something which does not always occur in an inflammation. It may also be urged that we may have gingival and pericemental inflammation and alveoloclasia without pocket formation taking place. In other words, it is only through actual destruction of the pericementum that the type of disease under discussion is established.

One more type of periodontal destruction remains to be considered, viz., the periodontal abscess. The periapical abscess as a subdivision of this type needs no comment, but parietal abscesses are not so well understood. They are divisible into *pericemental and gingival* abscesses. The former arise in the pericementum and are not closely associated with either periapical disease or with parietal pockets. The gingival abscesses are located in gingival tissue and are of two main types. The first is located in cemental gingiva which has suffered no appreciable separation from the root, or in other words exhibits no pocket formation. It is commonly found under recently cemented orthodontic or crown bands, or is caused by the forcible impingement into the gingival crevice of hard particles of food. We call it a *superficial gingival abscess* in contradistinction to the second type of gingival abscess. The latter type is invariably associated with pocket formation. It occurs near the base of the pocket and is located in the gingival tissue overlying this pocket. We call this the *deep gingival abscess.*

A review of the terms proposed for these five chief types of periodontal disease may make it seem that their acceptance would imply the acceptance of my views on the pathology of these disease processes. Such is not necessarily the case, for it will be found that each

one has been chosen with the thought of avoiding as far as possible the designation of any particular pathologic process. They do, however, refer to definite processes, each of which can be demonstrated both clinically and under the microscope. They serve to give both the operator and researcher a vocabulary which is intelligible and whose individual terms are restricted sufficiently to avoid vagueness of meaning.

The periodontist is also interested in an occlusal condition, or rather a condition in which there is a lack of occlusion. In the past this has been called paradoxically an open bite occlusion. The term *nonocclusion* seems to be satisfactory as a designation for this abnormality. When it is present from the time of the eruption of the teeth it has been called by Stillman *congenital nonocclusion.* While subject to criticism on the ground that the word *congenital* is usually applied to conditions appearing at birth, the original meaning of the word makes it applicable to conditions associated with the formation of the part. The desirability of using this adjective comes from the fact that teeth which have never been in function, usually exhibit a more pronounced lack of tone in their periodontal tissues than do those which have been in function for even a short time.

Afunctional is suggested as an adjective used in referring to this lack of function. The noun *afunction* is found in the medical dictionary, meaning "lack of function," hence the adjective is advanced as etymologically correct.

One more word and a derivative of it remains to be presented. For many years the attention of the dentist in the treatment of periodontoclasia has been focused upon the removal of *tartar* from the teeth and roots. Feeling sure that this hard deposit was all that required his attention, when tartar was lacking he was at a loss as to what he should do. With the thought that there are other things beside tartar which may require surgical removal, his understanding of both pathology and treatment are immensely broadened. Here again we find no word which seems adapted to designate the varied substances encountered in correct root surgery. Study of the Greek brought forth the verb *apoxeo* meaning "I shave away from," or "make smooth." *Apoxemena* therefore is a noun meaning the substances shaved or scraped off from the root or tooth surface. It includes everything from tartar to the superficial layer of cementum, which we know should be removed in root surgery. The act of removing apoxemena from the tooth is then known as *apoxesis.*

It should be borne in mind that the reason for suggesting these words, as also those which appeared earlier in this paper, has been twofold. The first was the effort to broaden the dentist's conception of periodontal pathology by suggesting to him the varied nature of the processes which are going on in the mouths of his patients. These terms have been used by me in postgraduate teaching for several years, and not only through their acceptance by students but by the ease of presenting clearly the phenomena under discussion, have they proven their value. And it is with this background of practical use, as well as a confidence in their pathological and etymological soundness, that they are respectfully submitted.

Discussion

R. Ottolengui, New York, New York: Dr. McCall, in speaking of using the Greek and Latin in coining new words, says that it is desirable that, as far as possible, we should use one to the exclusion of the other in any given science. This is scarcely true. In biology, for example, in the naming of new genera and species it has been customary to use the Greek for the genus and the Latin, (or Latin form) for the specific name. And even this is not arbitrarily done, many genera having names in Latin form. Dr. McCall tells us truly that at times it is necessary to unite the two languages, and that this may be "anathema to the purist." Here again I think he overstates the case. Latin and Greek

are congeneric and largely collateral and the union of the two is often very satisfactory. When we come to languages which are totally foreign in form, the one with the other, the union is anything but satisfactory. It is "anathema" indeed. When the Roentgen Society coined the word roentgenology, joining a German proper name with a Greek root, they committed a philological crime.

We cannot but sympathize with Dr. McCall in his efforts to solve some of these problems that confront us in the purification of our terminology. His citation of the word "pocket" is peculiarly apt. What, however, is the need of finding a word to express the false idea "pocket?" Pathologically speaking, is not the condition a true fistula? And this brings us to the odd fact that the words fistula and sinus are strangely misused. Fistula in Latin means "a tube; a pipe;" sinus means a "bowl or basin." Yet men speak of abscesses that discharge through a sinus, and really think that they are using choice language. This is not the time to discuss these two words, but they are worth study. Perhaps Dr. McCall may find a word for "pocket" along these lines. Dr. McCall's discussion of the prosthodontia is of course very satisfactory to me, and I think that his argument in favor of the word is entirely logical and sound. The criticisms that have been expressed that the word only conveys the idea of supplying artificial teeth and hence does not cover the restoration of lost soft tissues, is akin to the criticism of the word "radiodontia," that this latter word conveys the idea of radiographing the teeth but not the alveolar process. If such restrictions are to obtain we could scarcely coin any words at all, since every specialty of medical science must cover a field too broad to be included within the meaning of a single Greek or Latin derivative. The word "dentist" itself would fall, because derivatively it refers to teeth only, and not to gums and bone.

In regard to the term periodontoclasia, and the abbreviation there of "periclasia," I think that the original committee who suggested these terms erred. Periclasia may be more convenient to speak, but when written or printed it would be meaningless to a man meeting it for the first time. The periodontists would do well to drop it as quickly as possible.

I am in accord with what Dr. McCall has to say in relation to the word "approximal" and "proximal," but I must disavow credit for calling attention to this. J. D. White, editor of the "*Dental Cosmos*," presented unanswerable arguments against "proximal" when that word was first offered. I but followed his correct lead.

L. P. Anthony, Philadelphia, Pennsylvania: In reading Dr. McCall's paper, I was hoping that his statement that the nomenclature of distinct branches of science should be derived from one of the derivative languages, Greek or Latin, to the exclusion of the other, was a typographical error, but since I find that it is not, I must disagree with him. I can see no reason why we cannot avail ourselves of the benefit to be gained from deriving our words from the two combined sources. If we were restricted to the use of one, I should say the choice would be Latin, because Greek is being largely omitted from our college curriculums.

I am in full accord with his preference for *prosthodontist* in place of *prosthetist,* because of the fact that the former designates the particular location of the body in which the replacement is to be made.

He has proposed one word, *periodontium,* which I fear will involve many serious complications. He proposes periodontium to mean the tissues surrounding or about the tooth root, namely, the gingival tissue, the alveolar bone and the pericementum.

I would remind him that the word *periodontium* has long been in use in our literature as synonymous with *pericementum,* the peridental membrane and the periodontal membrane, not only in English, but in the French and German. His point of view and his argument is good as supporting the use of the word periodontia, which we have come to accept as meaning the science and art of treating the tissues around the tooth, but in a definite study of the word I have come to believe that it is not etymologically sound. We feel that the better word to express the meaning we have attributed to *periodontia* would have been *parodontia.* Then the word *parodontium* would mean exactly what he attributes to *periodontium.* The Greek prefix *peri* means, in anatomic nomenclature, ***around,*** surrounding or enclosing the part or organ denoted by the second element of the formed word; while *para,* in anatomic nomenclature, means relating to an organ or part situated beside or near that denoted by the second element of the formed word. Hence, to establish the use of periodontium in the sense in which Dr. McCall uses it, we must disregard its past use in our own literature as well as in foreign languages. But we can easily avoid this inevitable confusion by use of the word *parodontium,* which would mean just what Dr. McCall wishes to designate, namely, the pericementum, the alveolar bone and the gingival tissues. We may add that in the German and French the words *paradentium* and *parodontium* are already used in the sense indicated.

Dr. McCall says that we cannot, if we agree with his argument in favor of periodontium, consistently use the word *periodontitis* as a collective noun, to which statement I agree; but I must again remind him that the word *periodontitis* is already in use in medical nomenclature as meaning inflammation of the periodontal membrane (pericementum); and on the other hand, we have the word *parodontitis* meaning inflammation of the tissues about a tooth (the parodontium).

It appears, then, that it would be better if the periodontist called himself a parodontist and leave undisturbed the words *parodontium, periodontium, parodental, periodontal,* etc.

Dr. McCall's distinction between the marginal gingiva and the cemental gingiva is another refinement of our nomenclature that appeals to me as being quite sound.

The word *proximal* we believe has been generally approved and accepted in dental literature. The Century and Standard dictionaries give *proximal, proximate* and *approximate* as synonymous.

In the use of *intermaxillary* and *interdental,* I believe that a distinction should be made between these two words by using *intermaxillary* to indicate between the upper and lower jaws, and *interdental* strictly confined to indicate between adjacent teeth.

With regard to *parietal* to designate a location along the side of a tooth root in preference to *lateral,* I do not see any occasion for confusing the use of the adjective *lateral* in its general meaning with the incisor teeth. Besides, there arises an objection to *parietal* in that it is used in anatomic nomenclature as applying to the wall of a cavity or hollow organ.

While we heartily commend Dr. McCall's effort to standardize the nomenclature of the specialty of *periodontia,* we trust that he and his associates will guard against the tendency of specialists to originate too many new and necessarily confusing words, but endeavor to conform their nomenclature as much as possible to that of the parent science for the good of both and to the end that both the specialist and the general practitioner may speak the same language understandingly.

Louis Ottofy, Chicago, Illinois: Dr. McCall stated that the term *periodontium* includes the pericementum, alveolar bone and gingival tissue. My impression has always been that this term includes only the soft tissues surrounding the cementum, lining the alveolus, and the intervening membrane. My knowledge of histology is not perfect, but I always thought the tissue designated as the periodontium consists of the periosteum which surrounds the root, and is known as the pericementum, the periosteum which lines the alveolus and the alveolodental fibers which connect these two tissues. I do not understand that the term includes the alveolar bone and the gingival tissues. My understanding is that, for want of a better term, the term *investing tissues* means the gingivae, the alveolar process, the periodontium and the cementum.

Dr. McCall attributes to the modifying term *alveolaris,* when used in connection with pyorrhea, the meaning of a "flow of pus from the alveolar bone." This, I think, is not the generally accepted meaning, but, rather it signifies the flow of pus from an alveolus. I am not endeavoring to suggest any new terms or the retention of old ones, and while giving in the dental dictionary fifty-seven names of this disease, I made the following observation concerning this word: "This term (pyorrhea) has the sanction of age, having been introduced in 1822, and has since then not only been constantly used by the profession in its literature, but has become the term applied generally to this common disease. Whether it will ever be replaced by one more exact and more desirable remains to be determined. It may possibly prove as difficult to replace as for medical men to substitute for the bastard word *appendicitis* the correct term *scolecoiditis.*"[1] To this I may now add that, curiously enough, although a flow of pus is perhaps one of the most frequent of pathologic conditions, it is so rarely used in medical literature, (and then only in connection with a flow of pus from the nasal passages or the urethra) as to be almost negligible, and it seems to be permitted to stand as a term pertaining solely to a dental disease. It is unfortunate that the term more recently proposed, *periodontoclasia,* is to be modified to *dental periclasia* and also abbreviated to *periclasia.* The probabilities are that the short form, *periclasia,* will be the one most favored, and if it is eventually used to the exclusion of the other two, it will not be any clearer than *pyorrhea,* the one meaning a flow of pus (from somewhere) and the other a breaking down around (something).

Furthermore, the Greek verb *klado,* from which we derive *clasia,* I think is never used in Greek in the sense of the disintegration of living tissue, but rather in the narrower sense of breaking down, like of a chariot or a pillar. In fact, in neither French, German, Spanish nor Italian is the equivalent of the word *break* used as we use it in connection with broken down health, tissue or strength. However, no doubt those who have given this word more careful study have fully satisfied themselves that the Greeks used it in the sense of the disintegration of living tissue.

1. Ottofy, Louis: Standard Dental Dictionary, p. viii.

The terms pertaining to the gingiva, marginal and cemental, and the preference of gingival crevice to subgingival space are very happily conceived. It would be most desirable if gum and gums, gingiva and gingivae, could be correctly defined as to the use of the singular and plural. I have thus defined these: "Gingiva or gum, used in a constricted sense, refers to a small, definite area of this tissue. Gingivae or gums, used collectively, mean the tough fibrous tissue commencing at the free edge surrounding the teeth, covering the roof of the mouth and the alveolar processes and then merging into the mucous membrane without any definite line of demarcation." Indeed, it would be fortunate if gum and gums could be eliminated on account of their double meaning, that is, tissues and the sap of trees and shrubs.

As to the proximal and approximate, I have given preference to proximal and proximate under the impression that these terms have been conceded to be preferable, since there appears to be really no difference between the two. However, if Dr. Ottolengui has given these terms closer study, the ones he has found more applicable, in the sense in which we use them, should be given the preference.

Dr. McCall states that there is a tendency to avoid the use of eponymics so common in medical literature, such as Barlow's, Bright's, Hodgen's, Pott's and a host of other diseases. If that is the case, I stand corrected in holding the opposite view. I do not recall just where or when I read an interesting article on this subject in some medical journal. As I now remember it, the argument was strongly in favor of the use of eponymics, on the ground that a true discoverer of something worth while is entitled to be given that much credit for his discovery, which is usually not a matter of a mere accident, but rather the result of long, laborious and studious research; and also, because a justifiable pride has a tendency to encourage research and discovery for the sake of even so small and ephemeral a reward.

Reference is then made to the terms *alveoloclasia* and *pericementoclasia*. What I have previously said concerning the Greek verb *klado* applies here. We should avoid introducing a hybrid word, but apply ourselves to pure Latin or Greek, and also replace hybrid words now in use, whenever possible, by pure terms concerning which no further objection can be raised on this ground.

I am pleased that Dr. McCall has given so much consideration to the term *occlusion*, and trust that this may lead to some agreement on the various phases of this condition. With the other most commendable remarks concerning various terms, in principle, I fully agree.

I have always found it advantageous to admit my ignorance, and one of my most frequent answers to questions is, "I don't know." Then the other fellow will tell me everything he thinks or knows, or he thinks he knows about the subject, and in that way at times I pick up some information. I trust no one in this room will be offended if I express the opinion that there probably is not one among us who is a thorough and profound scholar of both Latin and Greek. By that I mean that he is able to think in those languages, and until one can think in a language he has not mastered it. The spoken word must express the thought which has been formulated in the mind in the same language in which it is spoken. If this premise is correct, then we must have many difficulties to contend with until our nomenclature is perfected.

It is quite possible that in attempting to describe pathologic conditions unknown to the Greeks and Romans, we may be obliged to resort to terms in which the exact condition cannot be fully expressed, or indeed, not expressed at all, as is so common in our own language that we give it no second thought. There is no sunrise or sunset, and yet how commonly these words are used! Let some one try to replace them with correct words. With our present-day knowledge would we speak of certain blood vessels as arteries, when we know that they were not channels conveying air? Even so common a word as automobile is a misnomer, as everyone knows that it will not go "by its inherent power of action or motion." We use the word automatic plugger; is it automatic? Sir Humphrey Davy said: "Nothing can be said to be automatic," and to this in all humility I may add "until perpetual motion is discovered."

Finally I may say that our policy should be to use such words as we already have, whenever possible, and if two words express the same thing, to use the shorter one. Let us be slow and cautious in coining new terms, and always remember that many pathologic conditions cannot be expressed in one word, and we must resort to two words, or even to phrases.

REPORT OF THE SCIENTIFIC FOUNDATION AND RESEARCH COMMISSION OF THE AMERICAN DENTAL ASSOCIATION

By F. O. HETRICK, D.D.S., Ottawa, Kansas

(Read before the American Dental Association, Cleveland, Ohio, September 10-14, 1923)

I HOPE to make this report as brief as possible and yet bring before your mind the importance of this department of your activity. In many ways we are like pioneers, blazing a way through uncharted territory, then again we come to a place where a trail has been blazed and, if we follow it blindly, it may lead to a crossing of some river that is dangerous because of the quicksands of guesswork. This is where the Dental Index is proving of inestimable worth in pointing out just who has been along this way before and the deduction he made from the materials at hand. In other words, we are trying not to cover the ground that has been covered before.

I want to make clear to your minds the value of the hearty cooperation of the universities that have permitted us to become affiliated with them. We could not hope in many years to own an equipment that would be anywhere near equal to that which we have been permitted to use in these various institutions. They have not only permitted us to name a problem and a research worker, but have paid most of the salary of the worker. Our directors of research in different places all work without pay. I do not at this moment recall a single technician whose salary we pay entirely. It has been a cooperative plan in which the universities and institutions have permitted us a share.

Research workers of the type that we want are necessarily high-priced men. They must be men with an open mind without preconceived ideas of the solution of all problems under the sun. The directors who are getting the best work out of their assistants and technicians are the ones who give them the problems to work out in their own way and then let them alone. They do not tell what conclusions they want or how they are to reach them.

Truths and facts are the two great things to be attained. Last year, while in Los Angeles, Dr. C. M. Murphy presented to our body a request for a grant for working on the problem of brown stains or mottled enamel of teeth.

Your chairman has been in Amarillo three times since our last annual meeting, January 29, 1923. Dr. Percy Howe accompanied him to Amarillo and attended a meeting of the West Texas Dental Society. Men there from a widely covered area afflicted with this trouble gave us a very good idea of the sort of survey that we wish to make. The best of the meeting was the enthusiasm created among the members of the West Texas society.

I feel confident that we will eventually solve this brown stain problem. You may hear something of the matter at this meeting in the reports of Dr. Theo. B. Beust and Dr. Percy Howe. I should like to go into detail as to what they found down there; but the time is limited and, if any of you care to hear the details, I should be pleased to have you interview me.

I recommended that their request for a grant be allowed—$1,500 for the year 1923-1924, under the direction of the chairman of the Commission. They are asking for the grant under the direction of Dr. Percy Howe, but I think some of the experiments should be made on the ground—in the matter of trying out the diet of animals which should be sent there, and where the food and water can be secured without shipping to some central point. Also I think a systematic effort should be made in securing the cooperation of parents whose older children are affected by this trouble, but whose younger children have not yet erupted their permanent teeth. This may not be the solution of the problem, yet we have found indications that it is a good line to follow; for instance, we found a family in which there was a pair of twins, one of which was badly afflicted with this brown stain and mottled enamel, while the other was almost practically immune. In questioning the mother, she said they had eaten at the same table and the same food. Yet when questioning the twins themselves, Martha, the one affected, said she lived mostly on meat and potatoes, but that she disliked milk, eggs, spinach, carrots and oranges, and never ate them raw, while Mary loved them and all the raw vegetables and fruit she could get. Hence Martha had a typical case, while Mary was practically immune.

We have a request for a grant of $500 from Dr. E. A. Thomas, Hastings, Nebraska, to pay for a technician to work on the problem, under his direction, on the subject "Dentistry's Relation to Psychopathology." We have been in correspondence with Dr. Thomas and the dentists of Nebraska, as well as some of the superintendents, in reference to the qualifications of Dr. Thomas to carry on this work. Dr. Thomas states: "The unanimous opinion of over two hundred medical superintendents of as many insane institutions representing every state in the Union is that dentistry is an asset to a state in the care of its wards, but they do not venture a conjecture as to degree or relationship." Therefore, our first objective: "How and in what degree is dentistry an asset to a state in the care of insanity?" A résumé of texts and literature on insanity and psychiatry reveals no standard classification applicable, so I have chosen for my work four general classifications.

The matter was taken up with some of the leaders in the dental profession in Nebraska. They fitted up an office with equipment suitable for this work, and they now have the help and cooperation of many of the leaders of the dental association in the state, who have unqualifiedly endorsed Dr. Thomas as thoroughly competent to direct this work. Those interested may have the opportunity of hearing him read a paper before the section of which Dr. Price is chairman at this annual session. I recommend that this request be granted. I would also recommend that our grants cover twelve months, instead of ending with the fiscal year. To keep competent technicians, it is necessary to hire them for at least a year.

If the directors know that their grants extend for the full twelve months, they will arrange their budget so they may not have an interval when they will not

have money to pay their workers. I believe, also, that we should have foresight enough to see that in working our research problems there should be a continuity of endeavor that will lead steadfastly toward solved problems as the goal. I refer you to the report of the secretary of this Commission as to the various problems on which the research workers are engaged, which I think will enlighten your minds as to the way the research money is being spent. Other problems will be taken up as rapidly as we have funds to stimulate their prosecution.

I want to stop just here and recall to your mind that without the cooperation of institutions having well-equipped laboratories our activities would be lessened to a marvelous degree, for they pay the greater proportion of the salaries of the workers and all the overhead expenses.

I would recommend that a set sum be allowed the president's office and the secretary's office, that they may have competent help, and not have to sacrifice too much of their time to the work of the Research Commission. Each of them should be able to maintain a room in their offices devoted exclusively to research work.

It is true that a few years ago you authorized them to pay necessary office expenses, but the ridiculously low expense account indicates that they have done most of the work themselves. I would also recommend that wherever you have a research worker in your immediate field, you show appreciation of his work by taking an interest in it. If a man fails of appreciation, he is robbed of a large part of his compensation. Let us therefore take interest and appreciate and try to understand their work in hand, and we will lighten their labors very much. We have had the utmost harmony in our Commission this year, and it has been a year devoted to progressive, constructive work; and while perhaps some of the research workers, working on the same problem with someone else, have thought the other fellow was piffling around or treading on their toes, they have gone ahead good-naturedly, working on the problem from their point of view, willing that the other man from his point of view might win out or lose out. This Commission cannot afford to engage in any contention of priority of thought or plagiarism. What difference does it make, if Truth is the one thing sought after, if we find it?

Nearly all of our research units of work are attracting considerable attention from professions other than our own. Especially is this true of the medical profession, as they are following with keenest interest the work on the kidney and urine, and the possibilities of physical changes brought about by variations of diet.

I herewith enclose the auditor's report of the first of July, also the secretary-treasurer's report and a list of grants allowed for the ensuing year.

Since this report has been read to the Research Commission, it is learned that an amendment to the Constitution has been passed by the House of Delegates that will reduce the income of the Commission. This reduction is regretted by the Commission as it will necessitate the reduction of the research effort. True it is that a surplus has accumulated in the research funds, but the reason for this accumulation is explained by the fact that since the Research Institute has been closed three years ago, the Commission has been attempting to build slowly and carefully a competent and safe research program. The budgets each year have been progressively larger as competent men have been found and enlisted. This year's appropriations are larger than last.

I believe that if the best results in research are to be obtained, it is necessary that we attempt a continuity of program and therefore increased support rather than curtailment.

ANNUAL REPORT OF THE SECRETARY-TREASURER OF THE RESEARCH COMMISSION

By R. H. VOLLAND, D.D.S., F.A.C.D., Iowa City, Iowa

(Read before the American Dental Association, Cleveland, Ohio, September 10-14, 1923)

To the Scientific Foundation and Research Commission:

GENTLEMEN:

DURING the year 1922-23, work in research, supported or assisted by this commission, has been carried on under nine grants. This is two more than for the year 1921-22. The location and amounts of these grants are as follows:

1.	University of Minnesota	$ 4200.00
2.	University of California	2000.00
3.	Northwestern University	2400.00
4.	University of Michigan	1800.00
5.	University of Louisville	1500.00
6.	Chicago College of Dentistry	2400.00
7.	Forsyth Dental Infirmary	3000.00
8.	Henry C. Ferris	1000.00
9.	Dental Index Bureau	3000.00
	Total	$21,300.00

A grant of $1000.00 was made to Creighton University to assist Dr. J. S. Foote. But Dr. Foote's health failed and up to date he has not been able to resume work and therefore none of this grant has been used. A condensed statement of work being done under each grant is as follows:

1. UNIVERSITY OF MINNESOTA:

Investigation—

a. Relation of surface tension of the medium to growth of bacteria.
b. The control of cocci.
c. Sources of infection of Bright's Disease.
d. Decalcification of tooth structures by bacteria.
e. Effect of diet and hygiene on the teeth and associated structures in the mouth of children in St. Paul's Orphanage. (See Note).

Director—T. B. Hartzell
*E. T. Bell
*W. P. Larson
*Laurene Krogh
*Margaret Graham
*Marion Stevens

NOTE: Dr. Stevens is in charge of the work at the orphanage.

2. UNIVERSITY OF CALIFORNIA:

Investigation—

a. Changes in saliva during diseased states—both oral and systemic—and under restricted diets.
b. Actions of "buffers" in saliva and their relation to dental caries and erosion.
c. Sterilization of pulp cavities.

Director—Guy S. Millberry
*J. A. Marshall
*C. M. Decker
*A stenographer (part time)

3. NORTHWESTERN UNIVERSITY:

Investigation—

a. Changes taking place in the teeth with treated and filled pulp canals.
b. Uric acid content of the blood in relation to focal infections of dental origin.
c. Apical region of treated and untreated teeth with reference to the changes that occur following disease and dental operations.
d. Changes in the bones of the jaws following dental infections and their relationship to focal infections in other parts of the body.
e. Comparative content of the blood and saliva, especially calcium, magnesium, urea, etc.
f. Pathological changes within root-canals.
g. Permeability of enamel, dentin and cementum.

*Workers marked with an (*) are the only ones receiving pay from the Commission.

Director—A. D. Black
*W. G. Skillen
*E. H. Hatton
Leon Ploche

4. UNIVERSITY OF MICHIGAN:

Investigation—
a. Apical infections.
b. Sterilization.
c. Gingival lesions.
d. Certain phases of dental caries.

Directing Committee:
M. L. Ward
R. Bunting
U. G. Rickert
*Faith Palmerlee

5. UNIVERSITY OF LOUISVILLE:

Investigation—
a. Metabolic processes in the enamel of erupted teeth.
b. Brown stains of enamel.
c. Secondary dentinal and cemental deposits.
d. Some phases of bacteriology of the mouth.

Director—H. B. Tileston
*Theo. B. Beust

6. CHICAGO COLLEGE OF DENTISTRY:

Investigation—
a. Histopathology of teeth and associated structures in situ with case history, radiographic and postmortem findings.

Director—W. H. G. Logan
*C. S. Suddarth
*L. D. Warner

7. FORSYTH DENTAL INFIRMARY:

Investigation—
a. Relation of restricted diet to dental caries, pyorrhea and associated diseases.
b. Brown stain of enamel.

Director—P. R. Howe
*Arnold Sonawa
*Ruth E. Hatch
*Madge Johnson
*Anne E. Tucker
*Mary F. Parker

8. HENRY C. FERRIS:

Investigation—
Relation of saliva to pathological condition, oral and systemic.

Director—Henry C. Ferris
E. E. Smith, collaborator
*E. V. Graves

9. DENTAL INDEX BUREAU:

Continuing the work of indexing periodical dental literature.

a. Up to date two five-year volumes have been published—1911 to 1915—and 1916 to 1920—also an index for the 1921 periodicals.

b. A volume indexing all journal articles from 1839 to 1875 is about ready for the printing and a volume covering the years 1876 to 1890 should be ready for the printer by November of this year.

c. All articles in the 1922 journals have been indexed but some unavoidable delays may make it a matter of economy to get out a joint volume for the years 1922-1923.

Director—A. D. Black
Wm. Bebb
*Glady E. Sherman, cataloguer
*Olga Griswold
*Minnie Malling

Dentists in Texas have requested that some research work be done on the brown stain and atrophy of enamel found in the mouths of native children in Northwest Texas. This stain is similar to the stain that is endemic to parts of Colorado, South Dakota and some other localities in this country. After a visit of Chairman Hetrick and Dr. Howe to Texas last winter, a limited amount of work has been done on this problem by Howe and Beust.

SUMMARY

	Year 1921-22	Year 1922-23
Number of Grants	8	10
Number of Grants being used	7	9
Number of persons directly interested and working on problems	25	37
Number of workers being paid by the commission	14	23
Number of investigations or pieces of work being done	18	29

The Secretary-Treasurer's books and accounts have been checked and audited on

June 30, 1922, and an official copy of the audit is in the hands of the Chairman. The following is a copy:

Iowa City, Iowa, July, 1, 1923.

Dr. R. H. Volland, Treasurer,

Scientific Foundation and Research Commission of the American Dental Association, Iowa City, Iowa.

Dear Sir:

I herewith submit report of the condition of your account as treasurer beginning June 30, 1922 and ending June 30, 1923.

RECEIPTS RESEARCH FUND

Balance, June 30, 1922	$33,779.54
Annual dues State Society	18,843.70
Interest	823.28
Total	$53,446.52

DISBURSEMENTS RESEARCH FUND

Office supplies	$ 31.21
Miscellaneous expense	413.77
Hartzell	3,954.55
Howe	2,943.42
C. C. of D. S.	2,375.00
D. I. B.	3,361.85
N. W.	2,200.00
Ferris	1,000.00
California	2,077.33
Michigan	1,800.00
Louisville	1,125.00
Balance, June 30, 1923	32,164.39
Total	$53,446.52

BUILDING FUND

Balance, June 30, 1922	$100.00
Balance, June 30, 1923	100.00

MONEY DEPOSITED AS FOLLOWS

First National Bank of Iowa City	$ 7,201.02
Farmers Loan & Trust Co.	24,963.37
Total	$32,164.39

BUILDING FUND

First National Bank of Iowa City	$100.00
	$100.00

CHECKS NOT YET PRESENTED FOR PAYMENT

No.	Amount
495	$ 38.00
7	145.00
8	80.00
9	25.00
500	12.00
1	125.00
502	420.00
3	100.00
4	100.00
5	23.00
6	25.00
	$1093.00

Respectfully submitted,
J. E. GATENS, *Teller,*
First National Bank of Iowa City, Iowa.

Research dues for May and June, amounting to $4684, were not received in time to appear in this statement.

In order to summarize and bring to your attention quickly the condition of the finances of the commission, the following table and comparisons are made.

	Year 1921-22	Year 1922-23		
Annual Dues Received by Sec'y Treas.	$23,999.10	$23,537.70	Dec. $	461.40
Int. Rec'd	640.00	823.28	Inc.	183.28
Number of Grants	8	10		
Budget	15,500.00	22,300.00	Inc.	6,800.00
Budget Disbursements	10,544.20	21,094.40	Inc.	10,550.20
Administration Exp.	470.78	444.98	Dec.	25.80

The comparison of Dues Received shows a decrease of $461.40. The Secretary's office of the American Dental Association deducted $1000.00 from the January 1923 remittance to cover expenses of collecting and accounting Research Funds. Therefore there was an increase during the fiscal year of the total research dues paid of $538.60.

Attention should be called to the expenses of collecting and administering these funds.

Collecting and Accounting-Secretary's Office A.D.A	$1000.00
Administering the Funds (Total expense of Chairman, Secretary-Treasurer and Commission)	444.98
	$1444.98

The balance that is deposited in the Farmer's Loan and Trust Company is bearing 4 per cent interest, compounded semi-annually. This fund is sufficiently large that it may be advisable to invest a part or all of it in good securities.

STATEMENTS OF GRANTS ON JUNE 30, 1923

	Grant	Disbursement
University of Minnesota	$4200	$3954.55
University of California	2000	2077.33
Northwestern University	2400	2200.00
University of Michigan	1800	1800.00
University of Louisville	1500	1125.00
Chicago College of Dental Surgery	2400	2375.00
Forsyth Dental Infirmary	3000	2943.42
Henry C. Ferris	1000	1000.00
Dental Index Bureau	3000	3361.85

At the time of writing this report, checks have been issued which have closed some more of these accounts and overdrawn others. But this year the annual meeting is a month later than usual and it was thought expedient to

permit some overdraft in order that directors might keep their staffs together until a new appropriation could be made. These overdrafts can be charged off any new appropriations that are made.

Respectfully submitted,

R. H. VOLLAND,
Secretary-Treasurer.

SUPPEMENTARY REPORT:

GRANTS REQUESTED FOR 1923-1924

The following list of formal applications for grants for the fiscal year 1923-1924 are filed with the Secretary-Treasurer. In compiling this list the secretary has taken liberty of condensing or outlining the requests.

I. UNIVERSITY OF CALIFORNIA:

G. S. Millberry—Director

Investigation—

1. A study of the alterations in dental tissues resulting from malnutritional disorders.
2. A study of the action of the "buffer" substances in saliva and their relations to dental caries and erosion.
3. The therapeutic action of solutions of radium salts.

Askings:

$1200.00 to J. A. Marshall for service
480.00 for technical assistance
320.00 additional stenographic service and equipment.

Total $2000.00.

The University and Hooper Foundation for Medical Research are cooperating with Dr. Marshall and his workers and are providing material and facilities.

Grant for 1922-23—$2000.00.

II. FORSYTH INFIRMARY:

Percy R. Howe—Director

Investigation—

1. Dental caries
2. Pyorrhea

The relation of restricted diet to these and other associated diseases is being studied.

Askings:

$ 400.00 for Miss Hatch, part salary. Has been seven years in the work, Wellesley graduate, two years in medical school, Principal part of Miss Hatch's salary paid by Forsyth Infirmary. "She cannot be replaced."
1700.00 Graduate of Medicine-Chemist and pathologist.
1500.00 Assistant to follow more fully the pathological and chemical changes in the fluids and foods of these animals.
840.00 Woman who prepares foods. She is accurate and works hard—$70 per month.
150.00 General help for extra time and Sundays.

Total $4590.00 but asks for $4500.00.

Harvard Medical School has given two rooms for Howe's work. Additional room has also been allotted to him in Forsyth Infirmary, thus providing more laboratory and animal room. Sixty-two monkeys have been studied up to date. Twenty monkeys and one hundred guinea-pigs under observation.

"Such money as Mr. Forsyth provides is for salaries, equipment and materials, to say nothing of the use of the building, lighting and heating. Mr. Forsyth has been very generous to the dental profession and we must do all we can to make the most of our opportunities.

Grant for 1922-1923—$3000.00 Increase $1500.00.

III. UNIVERSITY OF MINNESOTA:

T. B. Hartzell—Director.

Investigation—

1. Sources of infection and Bright's Disease.
2. Control of cocci.
3. Decalcification of tooth structure by bacteria.
4. Effect of diet and hygiene on teeth and associated structure in mouths of children in St. Paul's Orphanage. A clinical study under supervision of Dr. Marion Stevens.

Askings:

For 1, 2, and 3	$3600.00
For 4	600.00
Total	$4200.00

Dr. Bell and two assistant workers are to do the investigating of (1). Animal inoculations will be employed. The American National Research Council is providing the money to buy monkeys, the animals to be used in the inoculation experiments.

Grant for 1922-1923—$4200.00.

IV. HENRY C. FERRIS:

Investigation—

Relation of saliva to pathological conditions, oral and systemic.

Askings:

$1000.00 for technician and supplies.

This is essentially a chemical investigation.

Grant for 1922-1923—$1000.00.

V. UNIVERSITY OF LOUISVILLE:

H. B. Tileston—Director

Investigation—

1. Influence on the metabolic changes in enamel.
2. Brown stain and atrophy of enamel.

Askings:

Theo. B. Buest $1500.00

Details of this request are being arranged and will be reported at the annual meeting.

Grant for 1922-1923—$1500.00.

VI. WEST TEXAS DENTAL SOCIETY:

F. O. Hetrick—Director

Investigation—

1. Brown stain and atrophy of enamel in native children of West Texas.

Askings:

$1500.00—Workers (Howe, Beust, Leon Williams, Wofford). Laboratories and facilities.

NOTE: Drs. Howe and Beust have been doing some work on this problem during 1922-23. (See Sec.-Treas. report).

VII. NEBRASKA'S STATE HOSPITAL, *Hastings, Nebr.*:

E. A. Thomas—Director. (Dr. Thomas is in charge of the dental work of this hospital.)

Investigation—

1. (a) Survey of mouths and teeth when patients are admitted. (b) Treatment of mouth conditions found in survey. (c) Attempt to establish working hypothesis on relation of oral conditions to psychosis.
2. Histopathologic study of tissues and teeth removed from patients.
3. Some biochemistry phases.

Askings:

$500.00 for biochemist part time.

VIII. NORTHWESTERN DENTAL SCHOOL:

A. D. Black—Director

Investigation—

1. Pulpless teeth and their relationship to the rest of the body. A laboratory and clinical investigation. Chemistry and bacteriology of saliva, blood and other fluids of the body, also histology and pathology of such specimens as can be obtained.
2. Metabolism of inorganic substances, i. e., calcium under various conditions of disease, diets and bodily states, i. e., pregnancy. One obstetrical hospital has promised co-operation on the last phase.

Askings:

William G. Skillen $1200.00
E. H. Hatton 1200.00

Total $2400.00

Grant for 1922-1923—$2400.00.

IX. SAN QUENTIN PRISON GROUP:

F. V. Simonton—Director

Investigation—

Pyorrhea "Composite attack on the pyorrhea problem."

Work now being done by

1. Five dentists
2. One physician
3. Two bacteriologists
4. One pathologist
5. One chemist
6. One biochemist

Material:

San Quentin Prison

Warden Johnston and Dr. Stanley (prison physician) sympathetic and supporting.

At present inadequately financed.

Sources of support:

1. Association Radiograph Laboratory (owned by dentists, Dr. Millikin, Manager). $100 per month.
2. California State Dental Association. $500.00.
3. Research Board University of California. $910.00.
4. Working on other sources.

Plan of expending money:

1. $50.00 per month as additional compensation for part-time service of university research workers of professional grade.
2. $1200.00 per year for assistants full time, under directions of heads of departments.

Facilities:

1. University—General and special laboratories and equipments.
2. Dental school.
3. Prison.

NOTES:

Professor Clark, biochemist, University of California, is now working on mineral metabolism in relation to pyorrhea.

Dr. F. V. McCollum has consented to be a corresponding and consulting member of the group.

Dr. Lafayette Mendel of Yale has commended the work on this problem.

President Campbell of University of California and Dr. Sapman, Dean, Graduate Division and Chairman of the Research Board, University of California, have taken active interest.

This group requests that Dr. Marshall's support receive first consideration.

Askings:—$5000.00.

X. MELLON'S INSTITUTE:

Through the efforts of Dr. H. E. Friesell, tentative arrangements have been made for establishment of a Fellowship on a metallurgical problem in Mellon's Institute whenever the Research Commission cares to use it.

XI. UNIVERSITY OF MICHIGAN:

Director Committee—
R. Bunting
C. L. Lyon
U. G. Rickert

Investigation—

1. The bacteriology of various types of root end pathology. An attempt will be made to work out the bacteriologic findings of various forms of periapical disturbances and to correlate them with the history of the case, roentgenographic findings, and their morbid histology. This study will include various forms of so-called granulomas, periapical abscesses, cysts, and areas of condensing osteitis.
2. The bacteriologic study of dental caries making use of the forms of technique suggested by Lazarus, Barlow, James and Roderiquez.
3. Bacteriologic study of pyorrhea with special reference to the different microbic pictures in patients predisposed toward either caries or pyorrhea.

Askings:

$1800.00 Faith E. Palmerlee.

Grant for 1922-1923—$1800.00.

XII. CHICAGO COLLEGE OF DENTAL SURGERY:

W. H. G. Logan—Director

Investigation—

1. The microscopic study of histopathological changes occuring in the bony as well as the soft investing tissues of human teeth involved in chronic infective processes. Material for study is obtained from bodies of patients whose ante-mortem dental radiograms and case histories taken in conjunction with the findings in their post-mortem examinations suggest that their terminal illnesses may have resulted from dental focal infections. This is a continuation of the work under progress during the past year.
2. To make possible a study of the biological properties of anerobic organisms in an effort to ascertain their possible rôle in relation to the breaking down of tissues and in the prevention of tissue repair.

Askings:

$2400.00 for technicians.

Grant for 1922-1923—$2400.00.

XIII. DENTAL INDEX BUREAU:

A. D. Black—Director

Work—

Volumes published to date—
1916-1920
1921-Yearly volume
1911-1915
1839-1875

Volumes in process of preparation—
1876-1890
1890-1900
1901-1910

Yearly volumes 1922 and 1923 will be published as one volume.

Askings:

$3000.00 Cataloguers, classifiers, etc.

XIV. CREIGHTON UNIVERSITY:

Director Committee—
E. H. Bruening
C. E. Woodbury

Investigation—

A study of comparative dental anatomy and histology in an effort to discover the persistent faults in fundamental structures that directly accounts for subsequent pathology of both tooth and other hard tissues about the mouth.

Askings:

$1000.00 Dr. J. S. Foote.

NOTE—During the annual meeting of the Research Commission the following grants were approved for the fiscal year 1923-1924.

1	University of California	$ 2,000.00
2	Forsyth Dental Infirmary	4,000.00
3	University of Minnesota	4,200.00
4	Henry C. Ferris	1,000.00
5	University of Louisville	1,500.00
6	West Texas Dental Society	1,000.00
7	Nebraska State Hospital (Hastings)	500.00
8	Northwestern University Dental School	2,400.00
9	San Quentin Group	1,500.00
10	University of Michigan	1,800.00
11	Dental Index Bureau	3,000.00
12	Chicago College of Dental Surgery	2,400.00
13	Creighton University	1,000.00
	Total	$26,300.00

SOME THINGS OF IMPORTANCE TO BE CONSIDERED IN THE PRACTICE OF PERIODONTIA AND ORTHODONTIA*

By FRANK M. CASTO, M.D., D.D.S., Cleveland, Ohio

(Read before the American Dental Association, Los Angeles, California, July 17-21, 1922)

THE successful development, advancement and perpetuity of any specialty of medicine or dentistry is contingent on, first, the necessity for its existence, the establishment of an ideal, the inspiration of an idealist, and the incorporation into its practice of certain definite basic or fundamental principles. It further depends not alone on an exhaustive, scientific study of the problem, which directly concerns it, but on the scientific study, knowledge and cooperation of all allied specialties and on the sane and practical application of facts and principles thus evolved.

Strange as it may seem, it is nevertheless true that all specialties of medicine, and even medicine itself, owes most of its progressive and constructive evolution during the various periods to the genius of a single man, who, by his almost superhuman powers and mentality, his courage, honesty, and indomitable spirit, has enlisted followers who, believing implicitly in the principles propounded, have taken up the cudgel and fought for recognition and an exemplification of such principles and ideals. This in many cases has involved the sacrifice of friends, money and health. So has this same condition prevailed in the history of dentistry and its specialties. If it were wont to have been always so in the past, then we must believe that the future will be no different. Traditions well founded and established present a structure most difficult to destroy.

Without an attempt or a desire to take one iota of credit from the men who have contributed so largely, so unselfishly, so unhesitatingly and so magnanimously to the progress and life of orthodontia, and without eulogizing or espousing the cause of any person, nevertheless I desire to pay tribute to a man who has done most for modern orthodontia, and I am reminded of Hubbard's estimate of a great man in "Little Journeys to the Home of Jean Jacques Rousseau:"

"He is great who feeds other minds. He is great who inspires others to think for themselves. He is great who pulls you out of your mental ruts, lifts you out of the mire of the commonplace, whom you alternately love and hate, but whom you cannot forget."

It cannot be denied by any who are unprejudiced that the principles enunciated by this man now form the basis on which the practice of orthodontia is carried on.

Let us hesitate a moment and consider some of the things that he has done for orthodontia. He classified the knowledge, eliminated the empirical, set up and maintained an ideal, established scientific basic principles, co-related

*A preliminary report and discussion of this subject was previously published in the March, 1923, issue of the *Journal*.

and co-ordinated the study and practice, disassociated it from general practice, and did more than any other one man to force its recognition as a specialty. He associated and co-ordinated the practice of orthodontia to all other allied specialties of medicine and dentistry, and finally made it possible for a large number of men to comprehend and practice orthodontia intelligently. The development and progress of orthodontia probably could not have been brought about by any other means. Certainly, it must be admitted that his followers and others lent great assistance and participated continuously in advancing the great work that was begun by him. The man to whom I refer, as you all know, is Dr. E. H. Angle. Some may criticize me because of an apparent digression from my subject, but I disagree with them, because I think these things are pertinent and contribute to the soundness of the argument.

We all agree that in the practice of orthodontia we must be closely associated with the work of the ophthalmologist, the rhinologist, the oral surgeon, the radiologist, the pediatrician, the dentist and the periodontist. We must also have a clear understanding of the fundamental sciences. To attempt to define or describe the manner of association between the orthodontist and all of the specialties would be futile and inappropriate at this time, so I shall confine my further remarks to the relation and cooperation that should exist between the orthodontist and the periodontist.

It has been said that orthodontia and periodontia are to dentistry what hygiene and surgery are to medicine. If this statement is but half true, we can well recognize our responsibilities. At the completion of the deciduous denture, or even before, the responsibility of the periodontist begins. If he is given an opportunity to take complete charge of the child at this age, decay and periodontal disease will be prevented, and the need for other dental services eliminated, except in cases where the occlusion is such as to indicate or demand the services of the orthodontist. These conditions obviously should be recognized early, and it is the duty of the periodontist to make a diagnosis and recommend such correction of occlusion as is wise and expedient. It is no less the duty of the orthodontist to recommend prophylactic care and recognize and diagnose periodontal disease in its incipiency in cases of malocclusion under his care and treatment.

The orthodontist and the periodontist should collaborate in the study of many abnormal mouth conditions coming under their observation. If the orthodontist had a better comprehension of the scope or field of work of the periodontist, and the periodontist had a better understanding of the work of the orthodontist, the knowledge gained thereby would result in greater advancement in both fields of endeavor. A study of the etiology of periodontal disease reveals the fact that many cases are caused by mechanical irritation. In the division of mechanical irritation, Stillman and McCall have included among other things traumatic occlusion, orthodontic trauma, and injury to marginal cemental and alveolar gingiva, all of which are of vital importance to the orthodontist.

Stillman and McCall define traumatic occlusion as "an abnormal occlusal stress which is capable of producing or has produced an injury to the periodontium." Traumatic occlusion is most frequently the result of malocclusion, or of an abnormal contact of the occlusal inclined planes of the teeth. Injury to the periodontium usually does not occur until after the malrelation has existed for a considerable time. It may, however, occur in cases of short duration. This is more particularly true in cases under orthodontic treatment, especially where such treatment has placed one or more of the teeth in too prominent an occlusal position, which causes them to

receive too much occlusal stress, for example, in those cases in which the orthodontist is desirous of changing the occlusal plane by elevating some of the teeth in their sockets, a procedure which in time causes them to receive the full force of mastication or occlusal stress, or where molar teeth used for anchorage are elevated and tilted distally or mesially together with some rotation, or where a tooth is moved rapidly into a new position and is not protected by the support of the adjacent teeth. In these cases, if the teeth are permitted to remain in such positions very long, the periodontium is very likely to be damaged.

Stillman and McCall enumerate the following factors which they claim will introduce traumatic occlusion: "(1) interference with the freedom of the oscillating movements of the mandible through abnormal relationship of one or more opposing occlusal inclined planes; (2) occlusal stress delivered at an incorrect angle by the antagonizing teeth, and (3) supra-occlusion of a tooth as related to the line of occlusion, viz., elongation." These factors should concern the orthodontist very much. He has them to consider and deal with in every stage of orthodontic procedure. They should be taken into consideration during the preliminary survey of a case, during the active treatment, during the retention period and, in the final analysis, when the permanent occlusal relationship is established.

The introduction of traumatic occlusion into the practice of periodontia marks an important epoch in its history. It would be wise and expedient for every orthodontist to study this proposition from the point of view of the periodontist, and it would be just as advisable for the periodontist to study it from the point of view of the orthodontist.

Orthodontic trauma has been defined by Stillman and McCall as being a pathologic condition produced by the application of excessive force during orthodontic treatment. It is my understanding that this term was coined after they had observed a number of cases in which injury to the periodontium had occurred. This introduces another connecting link between the work of the periodontist and the orthodontist.

It has been observed and proved beyond the question of a doubt that mechanical irritation from crowns, fillings, clasps, orthodontic appliances, etc., when improperly placed or used, will produce disturbance and disease of the periodontal tissue, the severity of which depends on the character of the mechanical irritation. This being the case, it behooves the orthodontist to use the utmost care in the adjustment and management of orthodontic appliances. It is claimed that sometimes a simple mechanical injury to the periodontal tissues is sufficient cause for incipient dental periclasia, and when the interseptal fibers of the periodontal membrane are severed, they never again unite. This is significant to the orthodontist and indicates that extreme care should be observed in the fitting and placing of bands and the application of ligatures, or the adjustment of any other part of the appliances that comes in close contact with these tissues.

The prophylactic care of the mouth during orthodontic treatment is another important thing to be considered by the orthodontist in connection with the periodontist. I am afraid that this part of the work of the orthodontist is somewhat neglected, and I would call your attention to the seriousness of it, and the very great necessity of having an efficient prophylactic service rendered while appliances are in the mouth.

In conclusion, I would urge a closer cooperation between the orthodontist and the periodontist than has existed in the past, because I believe it will be a distinct advantage to both specialties in rendering a better and more efficient service.

AN APPEAL FROM THE DENTAL PROFESSION OF JAPAN

By DR. MORINOSUKE CHIWAKI, President of the Tokyo Dental College and President of the Dental Federation of Japan

THE first day of September, 1923, will be a day which will never be forgotten by the Japanese nation. This fatal day appeared to be just like any other day in the Japanese calendar. The autumn sun shone brightly in the early morning, but about 10:30 o'clock, clouds gathered and it rained a little. However, there was nothing unusual about such an atmospheric condition. Moreover, the people expected to have changeable weather about this time, especially since an equinoxial storm was bound to make its annual visit on the 210th day of the year, which fell due on the second of September.

A few minutes before noon, or to be more exact, according to the official record in the Central Observatory of Tokyo, at 11 o'clock, 58 minutes, and 45 seconds, there suddenly came a great shock, a vertical motion, followed by violent shakings and rockings, which continued for several minutes, accompanied by a peculiar sound, from whence or how originated, no one knows. The quakes, some slight, others severe, continued ceaselessly. During the three days following, there were over 1700 quakes of varied intensity and duration.

With the first great shock, buildings of every description collapsed. Fires started simultaneously in all directions in the capital city and raged for three days and a half, devastating all in its path, block by block, with the greatest rapidity. It was later officially announced by the Imperial Police headquarters of Tokyo that fires originated in eighty-eight places.

The city government of Tokyo possessed up-to-date fire extinguishing apparatus in all parts of the city, but the severity of the first shock destroyed the water main completely, so that the services of firemen, which are so well known for their efficiency in ordinary times, were of no avail whatsoever. About 411,000 houses were either consumed by fire or ruined by the earthquake. Even the modern Western style building of brick and concrete were no security against earthquake and fire, for they either collapsed or fell down in parts, and the huge flames, spreading rapidly, devoured them as easily as they did the native wooden structures.

Masses of people were encircled by smoke and fire, and so lost their lives. There was no path for them to escape. As the shock came almost at noontime, many were eating their noonday meal or were making preparations to serve lunch. As it is the custom for the Japanese to rush outside at such an occurrence, they left their houses empty-handed, with just what they wore. Many protected their houses until the very last or carried out their belongings on carts and bicycles to a safe spot, but the fire seemed to fol-

low them wherever they went, during the three days of conflagration, and in the majority of cases their possessions were burned.

The intensity of the fire was so great that thousands perished through suffocation. In this horrible way, over 33,000 met their death in one spot alone. In a place called Honjo, in Tokyo, there was a very large vacant lot which was formerly used by the government to furnish military uniforms to the soldiers during the Russo-Japanese War. Into this large space the Honjo populace fled in masses. Over 33,000 men, women and children rushed in madly, only to suffer unspeakable agony and to meet a most horrible death. It is officially reported that more than 74,000 persons in Tokyo lost their lives, but no accurate number can be ascertained even at this late date. It has been said that lives lost and missing will reach over 200,000 in Tokyo alone.

The story of Yokohama is sadder still, for there the shocks were more severe. Yokohama was the gateway for all foreign vessels, and many foreign firms were located in this main seaport city. Business offices were built in the lower parts of the city facing the beautiful bay, while the foreign residences were located on a high cliff called The Bluff. The earthquake was so violent that the first shock practically laid all buildings low and a ravaging fire completed the devastation in much the same manner as in Tokyo.

The Spot Where the Tokyo Dental College Stood.

Ever since that memorable visit of that genial American naval officer, Com-

modore Matthew C. Perry, in 1854, Japan opened her doors to all Western influences. Broadly speaking, law, politics, art, literature, science, industry, commerce, etc., were introduced and fostered by government officials. From the early days the government expended thousands and thousands of yen out of the Imperial Government's funds for the establishment of these institutions. In other words, much of the present civilization of Japan did not spring from the people entirely, but was largely placed upon them from above by government authority.

Strange as it may seem, however, dentistry has had a different birth. It was originally brought from America by American doctors and taught in private institutions, depending on private resources alone for its growth and development. It made such advancement that, before the earthquake, we had over 8,000 practicing dentists and seven dental colleges. In recent years, the dental profession has been elevating its standing gradually in the community, so much so that had it not been for this unprecedented affliction, dentistry should have reached the point of getting the proper recognition from government circles and the public at large as well as from the medical profession.

The Ruined Prosthetic Laboratory of the Tokyo Dental College.

In Tokyo, Yokohama, and the surrounding devastated regions, more than 1,000 dental offices were destroyed by fire. Some dentists lost their lives, some their families, while the rest had to flee with what they wore. Of the seven big dental dealers who import goods from abroad, five of them, being located in Tokyo, were completely burnt out and

their losses will reach an enormous sum of money. These dental dealers manufactured some dental goods in Japan, but their plants were all destroyed. Consequently, the sources of dental supply here are stopped entirely in Tokyo, for a brief period at least.

Five out of the seven dental colleges in Japan were located in Tokyo, as the capital city was not only the political but also the educational center of Japan. One dental college is located in Osaka, while another is at Fukuoka, on Kiushu Island. Two colleges out of the five in Tokyo were established for the education of women dentists. The total enrollment in these five colleges amounted to some 2,000 students, 1,500 men and 500 women. These were equipped with up-to-date dental requirements. The instruments, accessories and materials used were of imported kinds. These institutions were supported by private efforts entirely, none of them receiving subsidiary aid from the government. Now, these were all wiped out by this cruel earthquake fire.

Needless to say, what America has done for Japan in relief work is most wonderful, and the public at large appreciates it deeply. It will certainly be the means to ever cement the tie of friendship between these two nations. Japan cannot and will not forget this genuine American help. Especially what the Red Cross Society has accomplished in bringing over so quickly medical accessories, hospital equipment, food supply, etc., was so effective that we cannot tell you what great good has been done at this most critical time. This event proved beyond a doubt that the old idea that the Red Cross Society is of service only on the battlefields is entirely wrong. The Red Cross has shown itself most efficient and serviceable in peace as well as in war.

The report is that America alone raised $11,000,000. This is indeed an enormous sum of money to be sent by one nation in alleviating the suffering of another. It is a record-breaking achievement in the history of brotherly help. There can now be no question as to the brotherhood of man.

However, there is a certain feature of relief work which has been sadly overlooked, and that is in regard to the dental profession. Because of the fact that the proper conception of the importance of oral hygiene and the realization of the part it plays in public health is sadly lacking on the part of the government officials as well as the general public, no one seems to pay any particular attention to the relief and restoration of dentistry outside of the members of the profession.

Surely, the dentists, as professional men, knew the importance of fire insurance and all carried insurance policies. The colleges, too, were heavily insured. Almost the first thing after the terrible earthquake, their thoughts turned to the realization of the amount insured. To the great disappointment of all, however, the insurance companies rigidly decided not to pay one cent on the policies, because they maintain that there is an earthquake clause in the documents. Also, the foreign firms, that is, the foreign insurance companies, took the initiative, after the earthquake and fire, to announce that they will not pay the insurance money in this disaster, claiming that this was a natural calamity. This strongly influenced the decision of the native companies. The government, however, stepped in to mediate between the native companies and the policy holders, and they are still parleying. It is considered

lucky if these destitute people ever get from the companies 10 per cent of the amount originally insured, in the form of condolence money.

Everyone knows that the material resources of Japan have been and still are very poor, and owing to this great calamity, the situation is worse than ever. Funds are in exceedingly great demand, for the capital city must be rebuilt in an adequate manner, befitting the leading nation in the Far East. Yokohama, the main seaport of this empire, must also be considered. Unquestionably, this task of reconstruction will be a heavy drain on the purses of the people for years and years to come.

A dentist, in order to practice his profession, requires dental materials and accessories of every description. Without these he is totally at a loss. Where is the poor burnt-out dentist to turn for help? Are there no philanthropists in Japan? Yes, there are some philanthropists, but they do not realize the importance of oral hygiene, so it is of no avail to look in that direction for aid. What of the government? The government already has more than it can take care of, and dentistry being of minor importance in the eyes of officials, it is useless to appeal to them for assistance.

On the twenty-fourth of September, the representatives of the five dental colleges in Tokyo which were all burnt out. and some other dental societies, met and discussed the plan which was kindly suggested by an American dentist, Dr. L. E. Butler, who has been practicing in Yokohama for several years and who was also burnt out. The plan was to make an urgent appeal to the American Dental Association to extend relief to the dental colleges and dentists in these devastated regions. It was thought best to let the American ambassador get acquainted with this idea and we all interviewed him in order to ascertain his attitude in the matter. He was very kind in approving such a movement and readily gave his consent to assist in this direction. In order to give the matter a sort of official recognition, a cablegram was sent to the state department in Washington requesting that this message of appeal should be transferred to Dr. Otto U. King, the secretary of the American Dental Association. No doubt many dentists have been consulted in this matter and we trust that some effective action has been already started for this worthy cause.

America alone is our only star of hope, and to her we make our fervent appeal. America, so blessed with material wealth, so sympathetic, and so generous, will not turn a deaf ear. Ruined, destitute and helpless, the Japanese dentists and dental colleges look to the one source of help, America.

The Journal of the American Dental Association

5 North Wabash Avenue, Chicago, Illinois.

Please send in promptly notice of change of address, giving both old and new. Important information regarding subscription price, etc., will be found in the advertising pages.

Editorial

BENEFITS TO BE GAINED BY RAISING OUR DUES

The new era of usefulness inaugurated by our Association at the Cleveland meeting through the medium of a raise in dues should be fully visualized by our entire membership. While the whole scope of the possible benefits accruing from this action of the House of Delegates cannot be grasped at a single glance, yet it may be well at this time to touch briefly on a few of them. The practical good that may be done by an organization such as ours, with ample funds properly administered, must be apparent to anyone.

An outstanding example of this is the present rapid development in the Russian relief situation. When it was made apparent at Cleveland that the dentists of Russia were practically destitute, the hearts of American dentists went out to them in a quick response to their needs. It is unnecessary to review the beginning of this movement by Dr. Aguilar of Madrid, Spain, because our members are quite familiar with it, but it may be of more than passing interest to announce that through the splendid beneficence of America, dental manufacturers as well as dentists themselves, Dr. Aguilar has already shipped more than $10,000 worth of dental instruments to Russia. What this must mean to our Russian colleagues, who up to this time have been without the necessary equipment with which to earn a livelihood, can only be imagined. It is a benefaction of which the profession and dental dealers in America may well be proud, and we feel very sure that within a brief period our entire quota of 500 sets of instruments, representing a philanthropy of $25,000 will be fully subscribed. It will be a proud day for American dentistry when this is consummated.

Another urgent philanthropy at this time is that of the relief of Japanese dentists, as outlined in our January issue. If and when our

Association accumulates a relief fund of sufficient proportions, a sudden emergency such as widespread disaster among dentists might readily be met by the Association, instead of waiting for the slow process of raising funds from individual members. It is seldom that two situations such as confront the Russian and Japanese dentists occur within so brief a period of each other, but in our own ranks there is the constant necessity for providing means whereby worthy and deserving members who have been incapacitated by misfortune or ill health may be relieved from want and the incubus of debt in their declining years.

It will be of interest to our members to know that the response to the relief fund through the sale of Christmas seals was very gratifying, all previous records having been exceeded this year, though there are still some of our members who have not yet responded. We are quite sure that if these dentists were in a position to see the great need of this work, as are the officers of the Association, there is not one who would fail to send in his contribution.

The Secretary will present a detailed report on this matter at the next meeting in Dallas, and it is hoped that the loyalty of every state in the union will be manifested by a 100 per cent contribution to this permanent relief endowment fund.

Another matter of vital importance to the future development of dentistry is the educational program. Dental education in America has been undergoing a reorganization in recent years, chiefly through the agency of the Dental Educational Council. This organization, in conjunction with the consolidated body known as the American Association of Dental Schools, has much construction work to do in the future, and the American Dental Association, as one of the parent bodies bringing into existence the Dental Educational Council, has a deep interest in its aims, and a close connection with its work. Any practical aid that can be given to the furtherance of better dental education is helpful to the profession at its very foundation, because without education we would not have a profession.

Our members may have the positive assurance that in the comprehensive plan outlined at Cleveland there lies the seeds of a future development in the Association which up to this period has never been approached.

It takes time for all of these various enterprises to function properly, but the end-results will prove the wisdom of the action of the House of Delegates at the meeting of 1923.

MEMBERSHIP DUES DUE JANUARY 1, 1924

The dues for 1924 are $4.00, which include the annual subscripton to *The Journal of the American Dental Association*, and they are due January 1. The March *Journal* will not be mailed to any delinquent members. The ruling of the post-office authorities is adamant on this proposition. Therefore, any dentist who has not already paid his state society dues for 1924 should do so immediately. The state society officers are cooperating with the American Dental Association and will immediately, on receipt of the state dues, mail the national dues to the national office.

It will be impossible for us to furnish back copies, as we are printing only enough to supply our bona fide mailing list. An immediate compliance with this notice will save the delinquent member a great deal of confusion and misunderstanding. A delinquent member is one who does not have his 1924 membership card on January 2, 1924.

The editorial, "The Accomplishments of the Cleveland Meeting," in the *Journal* for October, 1923, gives a detailed statement of the amendment passed by the House of Delegates at the Cleveland meeting, increasing the dues to $4.00.

THE TWO EXTREMES IN CONTRIBUTIONS RECEIVED FOR THE DENTAL RELIEF FUND

Dear Dr. King:

Enclosed you will find my annual contribution of $25.00 to the Relief Fund of the American Dental Association.

I only wish that I might make this an annual contribution of $500.00.

Sincerely yours,

J. F. STEPHAN, *Cleveland, Ohio.*

Dear Dr. King:

I can only use 7 stamps this year, so I am returning the balance, 93, and enclosing 7 cents in cash.

Very truly yours,

The contributions to the Relief Fund received through the sale of Christmas seals for 1923 will excel all previous records.—Editor.

IN MEMORIAM

William Whitford

The noted medical and dental reporter, Mr. William Whitford, passed away at his home, 618 Clinton Avenue, Oak Park, Illinois, Dec. 10, 1923. The news of his death came as a distinct shock to his many friends in the dental profession. He had reported all the important dental meetings in this country for more than thirty years, and was widely known, both among dentists and medical men. At the time of his death he was official stenographer for most of the leading medical and dental societies, among others, the American Medical Association and the American Dental Association. At the Cleveland meeting of our association, Dr. Buckley made the following remarks:

"Before we adjourn I wish to call attention to a man who is not a member of our Association, present in this audience, who has been the official stenographer of the American Medical Association for thirty-four years continuously, and at the San Francisco meeting in June he was given a rising vote of appreciation by the house of delegates in recognition of his services. He has been the official stenographer of the American Dental Association for nine years. He is always present, but you never hear or see him. We could not get along without him, and in all my experience with medical and dental stenographers I do not hesitate to say that he has no equal. He does not leave out a comma or period or a necessary word. He does not insert a word that is unnecessary. I know the members of the Association appreciate the services that this man has rendered. Many of you do not know him by name, but he is Mr. William Whitford, of Chicago, and on behalf of the members of the American Dental Association I recommend that a rising vote of thanks be extended to him in recognition of his valuable services."

A motion was made, seconded and unanimously carried.

Mr. Whitford thanked the Association for the vote of appreciation given him.*

He had a wide knowledge of professional men and professional matters, and was a past master in his own particular work. Although he was not a graduate of medicine or dentistry, he had, in recognition of his great ability, been given honorary membership in at least two leading medical societies.

He was quiet in demeanor, modest, genial, obliging and lovable in character. He had friends everywhere, and will be missed at future meetings of all of our leading societies.

Mr. Whitford was born in Cornwall, England, in 1858. He came to Chicago in 1881, and has lived here ever since.

His last work was to report the Western Surgical Association at Colorado Springs, from which he returned ill with pneumonia, and died a few hours after reaching his home.

He is survived by his widow and a daughter, May, who assisted him in his work, and also by a sister in Dakota.

The sympathies of the entire dental profession will go out spontaneously to the bereaved family. While the loss to the profession is a very serious one, the loss to the family is irreparable.

*Minutes of Meeting, A. D. A., Cleveland, Ohio.

RUSSIAN RELIEF

AMERICAN DENTAL ASSOCIATION

Arkansas State Dental Society

A. T. Harper, Cotton Plant	$ 5.00	

California State Dental Society

C. C. Corbiere, Redding	$ 10.00	
George Blakesley Little, Palo Alto	10.00	
*California State Dental Society	5.10	
		$ 25.10

Colorado State Dental Society

Colorado State Dental Society		302.50

Florida State Dental Society

Florida State Dental Society		200.00

Georgia State Dental Society

*Georgia State Dental Society		50.00

Illinois State Dental Society

*Illinois State Dental Society	2033.50	
Chicago Dental Society (North Suburban Branch)	50.00	
J. W. Ford, Chicago	5.00	
H. C. Dewey, La Grange	3.00	
		$ 2,091.50

Indiana State Dental Association

*Indiana State Dental Association	183.00	
M. M. Alexander, Marion	50.00	
		$ 233.00

Iowa State Dental Society

Des Moines District Dental Society	100.00	
Burlington Dental Assistants	10.00	
		$ 110.00

Maryland State Dental Society

Harry E. Kelsey, Baltimore		5.00

Massachusetts State Dental Society

J. H. Nesson, Boston		5.00

Michigan State Dental Society

A. Ericson, Marquette		5.00

Minnesota State Dental Society

*Minnesota State Dental Society		15.00

Mississippi State Dental Society

Mississippi State Dental Society		200.00

Missouri State Dental Society

J. A. Heck, St. Louis	5.00	
*Missouri State Dental Society	1.00	
		6.00

Navy Dental Corps

Lt. Joseph Connolly, D.C., U.S.N.		2.00

New Jersey State Dental Society

*New Jersey State Dental Society	5.00	
J. Reich, Newark	5.00	
		10.00

New York State Dental Society

*New York State Dental Society	650.00	
Harlem Dental Society	100.00	
George Wood Clapp, New York	50.00	
S. Gettenberg, New York	10.00	
Long Island City Dental Society	5.00	
M. Linn, Brooklyn	5.00	
J. Rosenfeld, Liberty	5.00	
		825.00

North Carolina State Dental Society

North Carolina State Dental Society		300.00

North Dakota State Dental Society

C. D. Ferguson, Kulm	5.00	
*North Dakota State Dental Society	5.00	
		10.00

Ohio State Dental Society

*Ohio State Dental Society		500.00

Oklahoma State Dental Society

G. E. Zinn, Wagoner	3.00	
George W. Andree, Tishomingo	1.00	
		4.00

Pennsylvania State Dental Society

*Pennsylvania State Dental Society	50.00	
Academy of Dentistry, Pittsburgh	50.00	
Harrisburg Dental Society	50.00	
H. J. Kraft, Philadelphia	5.00	
H. I. Wagner, Altoona	5.00	
W. I. Zyner, Greenville	5.00	
		165.00

Southern California Dental Association

*Southern California Dental Association	602.00	
Edward J. Rohrer, Los Angeles	25.00	
H. C. Werts, Los Angeles	5.00	
		632.00

South Dakota State Dental Society

J. H. Wipf, Freeman	10.00	
R. A. Sikkink, Waubay	1.00	
		11.00

Texas State Dental Society

*Texas State Dental Society	188.00	
Southeast Texas Dental Society	19.00	
George S. Staples, Sherman	3.00	
J. A. Hall, Shamrock	1.00	
W. C. Neal, Abilene	1.00	
J. H. Rutherford, Stamford	1.00	
B. F. Thielen, Paris	1.00	
		214.00

Washington State Dental Society

*Washington State Dental Society	5.00	
W. A. Kerrison, Wilbur	5.00	
		10.00

West Virginia State Dental Society

D. B. Davis, Clarksburg	1.00	
C. M. Davis, Clarksburg	1.00	
		2.00

Wisconsin State Dental Society

G. B. Harvey, Green Bay	10.00	
Wisconsin State Dental Society	5.00	
		15.00

Total amount received from state societies	$ 5,953.10
*Contributions paid direct to Dr. Floristan Aguilar, Madrid, Spain	$ 2,604.00
Total American Dental Association Jan. 15, 1924	$ 8,557.10

RUSSIAN RELIEF

AMERICAN DENTAL TRADE ASSOCIATION

American Dental Trade Association	$2500.00
Ritter Dental Mfg. Co., Rochester, New York Forstbauer Equipment Co., New York City Columbia Equipment Co., Chicago, Illinois	500.00
Dentists' Supply Co., New York	500.00
American Cabinet Co., Two Rivers, Wisconsin	100.00
Columbus Dental Mfg. Co., Columbus, Ohio	100.00
Electro Dental Mfg. Co., Philadelphia	100.00
Buffalo Dental Mfg. Co., Buffalo	100.00
J. M. Ney Co., Hartford, Conn.	100.00
L. D. Caulk Dental Depot, Philadelphia	100.00
S. H. Reynolds Sons Co., Boston	50.00
Climax Dental Supply Co., Philadelphia	50.00
John Hood Co., Boston	50.00
Ransom & Randolph Co., Toledo	50.00
Billings Dental Co., Omaha, Nebraska	50.00
J. J. Crimmings Co., Boston	50.00
M. N. Jacobs Dental Supply Co., Davenport, Iowa	25.00
E. J. McCormick Rubber Co., Lodi, New Jersey	25.00
Davidson Dental Supply Co., New Orleans	25.00
Smith-Holden Dental Supply Co., Providence	25.00
E. R. Mitchell Dental Depot, Worcester, Mass.	25.00
Eugene Doherty Rubber Works, Inc.	25.00
Dayton Dental Supply Co., Brooklyn, New York	25.00
Dental Specialty Co., Denver, Colorado	25.00
Dunham-Reifel Co., Pittsburgh, Pennsylvania	25.00
Claudius Ash Sons & Co., New York	25.00
Dental Digest, New York	25.00
Rose Dental Depot, Little Rock Arkansas	20.00
Michigan Dental Supply Co., Kalamazoo, Mich.	10.00
Davis-Schultz Co., Inc., Buffalo, New York	10.00
King Specialty Co., Fort Wayne, Indiana	10.00
H. B. Wiggins Sons Co., Bloomfield, N. J.	10.00
Western Dental Supply Co., Salt Lake City, Utah	5.00
H. L. Hayden Co., New Haven, Connecticut	5.00
White-Rafert Co., Terre Haute, Indiana	5.00
Young Dental Mfg. Co., St. Louis, Missouri	5.00
Maine Dental Supply Co., Portland	5.00
Eckley Dental Supply Co., New York	5.00
E. L. Washburn & Co., New Haven	5.00
Nelson Gold Tooth Co., Brooklyn	2.00
Total American Dental Trade Association	$ 4,772.00

RUSSIAN RELIEF

FOREIGN

H. Kull, Oakaco, Oax. Mexico	5.00
W. K. Lewis, Shoreham-by-Sea, Sussex, Eng.	2.17
	7.17
Total Collection to January 15, 1924	$13,336.27

JAPANESE RELIEF

AMERICAN DENTAL ASSOCIATION

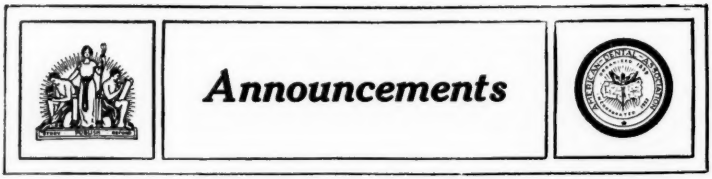
*Cash Receipts	$ 135.00
C. Kabell, Chicago, Ill.	30.00
C. M. Keep, Boston, Mass.	10.00
	$ 175.00

DENTAL INSTRUMENTS, SUPPLIES, BOOKS AND MAGAZINES

*Additional instruments, supplies, books and magazines received:

Allen Kearby, Dallas, Texas. (Books and Magazines)
W. H. Povale, Mt. Morris, N. Y. (Instruments)
E. G. Husband, Hutchison, Kansas. (Instruments)
N. S. Hanoka, Chicago, Ill. (Books)
Friedman Specialty Company, Chicago, Ill. (Instruments)
R. E. Milbourn, North Baltimore, Ohio. (Books and Instruments)
A. E. Schneider, Chicago, Ill. (Instruments)
Henry A. Honoroff, Chicago, Ill. (Instruments)
R. D. Temple, Burt, Iowa. (Instruments)
A. S. Dice, Clear Lake, Iowa. (Instruments)
L. W. Strong, Chicago, Ill. (Instruments)
Frank P. Gormley, Newport, R. I. (Instruments)
W. E. Tennant, Fond du Lac, Wis. (Journals)
E. H. Moss, Chillicothe, Mo. (Instruments)
Anonymous contributions of books and instruments (two packages)

*Itemized list of contributors published in the December and January issues of The Journal.



CALENDAR OF MEETINGS

NATIONAL SOCIETIES

American Dental Association, November 10, 11, 12, 13, 14, 1924, Dallas, Texas.

American Society of Orthodontists, March 18-21, 1924, Kansas City, Missouri.

Association of American Dental Schools, March 5, 6, 7, 1924, Congress Hotel, Chicago, Illinois.

Dental Protective Association of the United States, 4:00 p. m., December 15, 1924, Palmer House, Chicago, Illinois.

National Association of Dental Examiners, November 10, 11, 1924, Dallas, Texas.

STATE SOCIETIES

National Capital, at Washington, D. C., first Tuesday of every month.

February

Marquette University Dental Alumni Association, at Milwaukee, Wisconsin (20, 21, 22).

Minnesota, at St. Paul (12, 13, 14, 15).

March

Louisiana, at New Orleans (12, 13, 14, 15).

Vermont, at Burlington (19, 20, 21).

April

Alabama, at Montgomery (8).

Connecticut, at Waterbury (24, 25, 26).

Kansas, at Topeka (28, 29, 30).

Kentucky, at Louisville (7, 8, 9, 10).

Michigan, at Flint (14, 15, 16).

New Jersey, at Trenton (9, 10, 11, 12).

North Carolina, at Raleigh (21, 22, 23).

Oklahoma, at Enid (22, 23, 24, 25).

Virginia, at Norfolk, (28, 29, 30).

May

Arkansas, at Ft. Smith (12, 13, 14).

California State, at San Francisco (26, 27, 28, 29).

Illinois, at Springfield (13, 14, 15).

Indiana, at Indianapolis (19, 20, 21, 22).

Iowa, at Des Moines (6, 7, 8).

Maryland, at Baltimore (5, 6, 7).

Massachusetts, at Boston (5, 6, 7, 8, 9).

Mississippi, at Jackson.

Missouri, at Excelsior Springs (26, 27, 28).

Nebraska, at Lincoln (19, 20, 21, 22).

New York, at Binghamton (7, 8, 9, 10).

Pennsylvania, at Pittsburgh (13, 14, 15).

South Dakota, at Huron.

Tennessee, at Chattanooga, (5, 6, 7).

West Virginia, at Huntington (19, 20, 21).

June

Colorado, at Glenwood Springs (19, 20, 21).

New Hampshire, at The Weirs (18, 19, 20).

North Dakota, at Grank Forks (15).

Southern California, at San Diego (24, 25, 26).

Utah, at Salt Lake City.

Wyoming, at Cody (16, 17, 18).

July

Wisconsin, at Milwaukee (8, 9, 10).

November

American Dental Association, at Dallas (10, 11, 12, 13, 14).

Arizona, at Phoenix.

Texas, at Dallas (10, 11, 12, 13, 14).

December

Ohio, at Columbus (4, 5, 6).

MEETINGS OF STATE BOARD OF DENTAL EXAMINERS

Indiana, June 9 to 14. Secretary, H. C. McKittrick, 1006 I.O.O.F. Building, Indianapolis, Indiana.

Massachusetts, March 11, 12, 13, 14. Secretary, J. N. Carriére, 146 State House, Boston, Massachusetts.

New Jersey, at Trenton, June 23. Secretary, John C. Forsyth, 429 E. State St., Trenton, New Jersey.

DENTAL SOCIETY OF THE STATE OF NEW YORK

The fifty-sixth annual meeting of the Dental Society of the State of New York will be held at Kalurah Temple, Binghamton, N. Y., May 7, 8, 9 and 10, 1924. The literary exercises and exhibits will be held at Kalurah Temple. Dr. Thomas R. Cullen, of Oswego, N. Y., is chairman of the Exhibits Committee, and those desiring space should communicate with him immediately. The executive council will convene for the transaction of the business of the society Tuesday, May 6, at 3:00 p. m. Hotel reservations should be made direct with the hotel management. The headquarters are at the Hotel Arlington.

Every effort is being put forth to make this meeting one of the most attractive in the history of the society. A cordial invitation is extended to all ethical practitioners. Admission to the literary meetings and clinics may be secured by presenting membership cards in state or national societies.

For further information and programs address

A. P. BURKHART, *Secretary,*
57 E. Genesee St., Auburn, N. Y.

NEW JERSEY STATE DENTAL SOCIETY

The fifty-fourth annual meeting of The New Jersey State Dental Society will be held in the Stacy-Trent Hotel, Trenton, New Jersey, April 9-12, 1924.

The meetings embodying the literary program will convene in the auditorium of The School of Industrial Arts, adjoining the hotel.

R. S. HOPKINS, *Director of Exhibits,*
913 Broad Street, Newark, New Jersey.
F. K. HEAZELTON, *Secretary,*
223 East Hanover Street, Trenton, New Jersey.

MISSOURI STATE DENTAL ASSOCIATION

The annual meeting of the Missouri State Dental Association will be held May 26, 27 and 28, 1924, at Excelsior Springs, Missouri.

H. C. POLLOCK, *Secretary,*
Metropolitan Building, St. Louis, Mo.

OKLAHOMA STATE DENTAL SOCIETY

The Oklahoma State Dental Society will hold its annual meeting at Enid, April 22-25, 1924.

A. B. WALKER, *Secretary,*
Fairview, Oklahoma.

ILLINOIS STATE DENTAL SOCIETY

The sixtieth annual meeting of the Illinois State Dental Society will be held in Springfield, Illinois, May 13, 14, and 15, 1924. This meeting is open not only to all members in good standing of the Illinois State Dental Society, but also to all members in good standing of the American Dental Association, to all of whom an invitation is cordially extended. Admission to all sessions, clinics and exhibits will be by presentation of cards disclosing membership in the bodies mentioned above.

The local arrangements will be in charge of a committee of which Dr. J. J. Donelan, United Mine Workers Building, Springfield, Illinois, is chairman. The exhibits will be in charge of a committee of which Dr. J. Leslie Lambert, Ridgely-Farmers Bank Building, Springfield, Illinois, is chairman.

There is every indication that this meeting will be a record breaker both as to attendance and as to quality.

ALBERT E. CONVERSE, *Secretary,*
Leland Office Building, Springfield, Illinois

ARKANSAS STATE DENTAL ASSOCIATION

The Arkansas State Dental Association will meet in Fort Smith, Arkansas, May 12, 13 and 14, 1924. For further information, address

ELBERT STEWART, *Secretary-Treasurer,*
Little Rock, Ark.

MASSACHUSETTS BOARD OF DENTAL EXAMINERS

The Massachusetts Board of Dental Examiners will hold an examination for dentists and dental hygienists on March 11, 12, 13 and 14, 1924. All applications for examination should be filed at the office of the Secretary, 146 State House, Boston, Mass., at least ten days before date set for said examination. Further information, application blanks, etc., may be obtained at the same address.

J. N. CARRIERE, *Secretary.*

INDIANA STATE BOARD OF DENTAL EXAMINERS

The Indiana State Board of Dental Examiners will hold its next examination June 9-14, 1924. For further information address

H. C. MCKITTRICK, *Secretary-Treasurer,*
1006 I.O.O.F. Building, Indianapolis, Indiana.

FIRST ANNUAL MEETING OF THE AMERICAN ASSOCIATION OF DENTAL SCHOOLS

MARCH 5, 6, 7, 1924—THE CONGRESS HOTEL, CHICAGO, ILLINOIS

OFFICERS

Henry L. Banzhaf, president ..... 140 16th St., Milwaukee, Wis.
Marcus L. Ward, president-elect ..... Ann Arbor, Mich.
A. W. Thornton, vice president ..... Montreal, Quebec.
DeLos L. Hill, secretary-treasurer ..... 612 Grant Bldg., Atlanta, Ga.

EXECUTIVE COMMITTEE

Henry L. Banzhaf, president ex-officio ..... Milwaukee, Wis.
Marcus L. Ward, president-elect, ex-officio ..... Ann Arbor, Mich.
A. W. Thornton, vice president, ex-officio ..... Montreal, Quebec.
DeLos L. Hill, secretary-treasurer, ex-officio ..... Atlanta, Ga.
H. E. Friesell, 1924 ..... 1206 Highland Bldg., Pittsburgh, Pa.
Wm. H. G. Logan, 1925 ..... 29 East Madison St., Chicago, Ill.
Lewis E. Ford, 1926 ..... 704 Los Angeles Investment Bldg., Los Angeles, Calif.

OFFICIAL PROGRAM

WEDNESDAY MORNING, MARCH 5, 1924

9 a. m. to 12:30 p. m.

Registration of delegates, 9 to 10 a. m.
Invocation
Roll Call
President's Address,
Henry L. Banzhaf, Milwaukee, Wisconsin.
Report of Secretary-Treasurer,
DeLos L. Hill, Atlanta, Georgia.
Appointment of committees
"Oral Surgery Instruction, Undergraduate and Graduate"
Chalmers J. Lyons, University of Michigan
Discussed by
Leroy M. S. Miner, Harvard University
John F. Biddle, University of Pittsburgh
A. W. Thornton, McGill University

WEDNESDAY AFTERNOON, MARCH 5, 1924

2:30 to 5 p. m.

"Cooperation of the American Dental Association in Connection with the Advancement of Dental Education"
Otto U. King, secretary, American Dental Association
Discussed by
William A. Giffin, president, American Dental Association
Thomas J. Barrett, president, Dental Educational Council of America
Daniel H. Squire, University of Buffalo
Symposium. "Oral Diagnosis in Dental Clinics"
Russell W. Bunting, University of Michigan
Ernest A. Rogers, State University of Iowa
William H. G. Logan, Chicago College of Dental Surgery, Dental Dept. of Loyola University, Chicago
Edward L. Tharinger, Marquette University
Discussed by
A. Hugh Hipple, Creighton University
Sheppard W. Foster, Atlanta-Southern Dental College
R. Boyd Bogle, Vanderbilt University
Timothy Leary, Tufts College Dental School

THURSDAY MORNING, MARCH 6, 1924

9:30 a. m. to 12:30 p. m.

Reports of committees, 9:30 to 10 a. m.

"The Problem of Teaching Root-Canal Technic in Our Schools"
James R. Blayney, University of Illinois

Discussed by
Edward H. Hatton, Northwestern University
Pliny G. Puterbaugh, Chicago College of Dental Surgery, Dental Dept. of Loyola University, Chicago
M. D. Huff, Atlanta-Southern Dental College

"The Training of Dental Hygienists and Other Dental Assistants"
Wallace Seccombe, Royal College of Dental Surgeons

Discussed by
John F. Christiansen, Northwestern University
Harold J. Leonard, University of Minnesota
Harvey J. Burkhart, Rochester Dental Dispensary

THURSDAY AFTERNOON, MARCH 6, 1924

2:30 to 5 p. m.

"A Further Discussion of Some Problems in Dental Education"
William J. Gies, The Carnegie Foundation for the Advancement of Teaching

Discussed by
Marcus L. Ward, University of Michigan
Albert L. Midgley, Secretary, Dental Educational Council of America
H. Edmund Friesell, University of Pittsburgh

THURSDAY EVENING, MARCH 6, 1924

8 to 10 p. m.

Round Table Conference

Problems arising from "Conduct and Management of Dental School Clinics."

Thirty minutes is allowed for the presentation and discussion of each subject.

1. "Registration, Examination, Assignment of Patients and General Procedure Followed at First Sitting"
Victor T. Nylander, University of Illinois

Discussion opened by
T. J. O'Rourke, University of Louisville

2. "Routine and Special Group Instruction in Operative and Prosthetic Dentistry for the Backward Student in the Dental Clinic"
Otto F. Freitag, St. Louis University

Discussion opened by
William Leroy Wylie, Western Reserve University

3. "Method of Clinical Instruction in the Treatment of Pyorrhea Alveolaris"
John Oppie McCall, Buffalo, New York

Discussion opened by
Justin D. Towner, University of Tennessee

4. "Minimum Number of Operations Required in Operative Dentistry, Fixed and Removable Bridgework, Partial and Full Denture, and Method of Giving Credit in Each"
John H. Phillips, Vanderbilt University

Discussion opened by
H. C. Hebble, Ohio State University

FRIDAY MORNING, MARCH 7, 1924

9:30 a. m. to 12:30 p. m.

"The Pre-Dental Year"
Lewis E. Ford, University of Southern California

Discussed by
Alfred Owre, University of Minnesota
Herbert C. Miller, North Pacific Dental College
Charles R. Turner, University of Pennsylvania

"Advancements in Medical Education Since the Organization of the Council on Medical Education".
N. P. Colwell, Secretary, Council on Medical Education of The American Medical Association

Report on President's Address

Final Business Meeting

Election of Officers

Adjournment

STATE BOARD OF REGISTRATION AND EXAMINATION IN DENTISTRY OF NEW JERSEY

The State Board of Registration and Examination in Dentistry of New Jersey will hold its regular examination at Trenton, N. J., June 23, 1924. License fee, $25; re-examination fee, $10.00.

Practical tests required: insertion of an approximal gold filling with the approximating tooth in position, compound approximal amalgam filling and a silicate filling; candidate must furnish his own patient. Taking of impressions, bite, selection of teeth, articulation, trial plate; candidate must furnish his own patient. Practical examination in mouth diagnosis.

Attention is directed to the following quotation from the dental law of New Jersey: "Applicant shall present to said board a certificate from the Commissioner of Education of this State, showing that before entering a dental college he or she had obtained an academic education consisting of a four-year course of study in an approved high school or the equivalent thereof."

In accordance with this law the secretary will issue application blanks only upon presentation of the required certificate from the Commissioner of Education, State House, Trenton, N. J.

Application must be filed, complete, ten days before the date of the examinations.

Address all communications for further particulars to

JOHN C. FORSYTH, *Secretary,*
429 E. State St., Trenton, N. J.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS

The National Association of Dental Examiners will hold its annual meeting, November 10 and 11, 1924, on the Roof Garden of the Jefferson Hotel, Dallas, Texas.

H. C. MCKITTRICK, *Secretary.*

DENTAL PROTECTIVE ASSOCIATION

The annual meeting of the Dental Protective Association of the United States was held at the Palmer House, Chicago, Illinois, December 17, at 4 p. m. The report of the officers was given; a board of directors elected, and such business transacted as came before the association. The board of directors are as follows: J. G. Reid, president; D. M. Gallie, vice president and treasurer, and E. W. Elliot, secretary.

DENTAL HYGIENISTS ASSOCIATION OF THE STATE OF NEW YORK

The Dental Hygienists Association of the State of New York will hold its fourth annual meeting in Binghamton, New York, Friday and Saturday, May 9 and 10, 1924, in connection with the New York state society meeting. All dental hygienists in the state are urged to attend and a cordial invitation is extended to all those in other states. Detailed information will be published later.

GRETCHEN GOLDSMITH,
Corresponding Secretary,
1 and 11 Bates Block, Ithaca, N. Y.

NORTH PHILADELPHIA ASSOCIATION OF DENTAL SURGEONS

At the fifteenth annual meeting of the North Philadelphia Association of Dental Surgeons, held January 9, 1924, the following officers were elected for the year 1924: president, Dr. Wm. C. T. Bauerle; vice president, Dr. Leon A. Halpern; secretary, Dr. Warren A. Matlack; treasurer, Dr. John H. Yerrick; editor, Dr. J. Iredell Wyckoff; delegate to the Philadelphia Dental Society, Dr. M. F. Quinn and alternate, Dr. Thos. B. Wade.

ASKS AID IN SEARCH FOR FATHER

Eagle Grove, Iowa,
Dec. 18, 1923.

Mr. Otto U. King,
5 North Wabash Ave.,
Chicago, Illinois.

Dear Sir:

I am writing you seeking information as to the whereabouts of my father. If he is alive, I will give you an outline of the details and will be very thankful if you will be able to assist me in learning where I might be able to locate further information as to his record. He was a dentist operating in New York state some forty years ago.

I give you a record of my birth certificate as sent to me from the records of New York City: Alexander Emil Kronmeyer, born, New York City, Aug. 5, 1883; place, 216 Broome Street; name of father, Alexander Kronmeyer; mother, Mary Kronmeyer; maiden name of mother, Mary J. Dowling; age of father, 28 years; age of mother, 21 years; occupation of father, dentist.

I take it that the State Dental Commission of the State of New York would require working certificates of all dentists operating in the state and that there would be some means of finding some record of him there and what I wish to know is, who might I look to there

who would assist me in going over the records. It might be that there is a national directory conducted by the dental association which would throw some light on the matter.

I was sent out of New York state by the Children's Aid Society, located at 105 East 22nd Street, on Nov. 18, 1890. It seems that I was a year and three months old before being given to any children's society, the first Home being the New York Nursery and Child's Hospital, 161 West 61st Street, I being placed there on Nov. 6, 1884.

I realize that you are a busy man but possibly you will find the time to help me out. I have spent twenty-five years in my attempt to get my bearings, and it was but recently that I have been able to get the birth certificate giving the name of my parents and I feel now that with still further effort I will be able to make a great deal of headway.

Thanking you kindly for any assistance that you might give me, I remain,

Yours very truly,
(Signed) ALEX KRONMEYER.

AMERICAN SOCIETY OF ORTHODONTISTS

The twenty-third annual meeting of the American Society of Orthodontists will be held at the Hotel Muehlebach, Kansas City, Missouri, March 18-21, 1924.

WALTER H. ELLIS, *Secretary-Treasurer.*

NEW BOOKS RECEIVED FOR THE LIBRARY OF THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION

The Journal of the American Dental Association promply acknowledges herewith the receipt of new publications. Books selected from those named on this list are reviewed below. Reviews are matter-of-fact statements of the nature and contents of the publication referred to and are intended *solely to guide possible purchasers.*

"Ethics and Jurisprudence for Dentists." Edmund Noyes, D.D.S., F.A.C.D., Professor of Ethics and Jurisprudence in Northwestern University Dental School, Chicago, Ill. 249 pages. Printed and bound by W. B. Conkey Company, Chicago, $3.00.

"Report of the Surgeon General of the United States Army to the Secretary of War. 393 pages. Government Printing Office, Washington, D. C.

"Dental Surgery Notes." Ernest B. Dowsett, D.S.O., L.R.C.P., M.R.C.S., L.D.S., Dental Surgeon to Guy's Hospital and Lecturer on Dental Mechanics. 5th edition. 162 pages. The Dental Manufacturing Co., Lt., Alston House, Newman Street, W., London, Eng. Copies can also be obtained from the Dental Manufacturing Co., Candler Building, 220 W. 42nd St., New York, New York.

A plea for further enlightenment, by the establishment of chairs of oral surgery in medical schools, prefaces the book on "Cleft Lip and Palate" by Truman W. Brophy of Chicago. Abounding in illustrations, the text is simplified and each step is easily fixed in the mind of the student.

The author has abandoned the old term "harelip" and substituted "cleft lip." It is recognized by all that the term "harelip" is a misnomer. All fissures of the lip, with rare exceptions, are marked by clefts in the line along the union of the premaxillae and maxillae. The lip of the hare is cleft in the median line. A fissure in this location rarely occurs in the human family.

Newer instruments, designed especially for this work, such as the Logan traction bow, periosteal elevators, miniature curved needles with handles for introducing first sutures in cleft lip, appliance for retaining the elevated nose, straight bone spear, blunt probe-like needle and wire oral speculum are illustrated and fully explained.

The book is divided into six chapters, one each on the following subjects: cleft lip, cleft palate, atresia palati, infant feeding, speech training after cleft palate operations beyond infancy, and prevalence of cleft lip and palate.

One of the changes noted is the substitution of the Logan traction bow for the old type gauze rolls and hooks. The bow prevents sutures from cutting out, supports the tissues and allows free circulation and easy access to the suture line.

A revival of the old Ericsson operation is a feature in correcting the flattened nostril occurring so often after cleft lip and palate operations. This operation must not be confused with the author's original operation for elevating the tip of the nose. The new adjustable device for holding the tip of the nose in place after elevation, preventing sutures from cutting out and allowing freedom of movement to the patient without endangering the result of the operation, is of inestimable value.

The order of operations as originally advocated and taught is retained, but the time of operation is slightly changed from the original. The author suggests some time prior to the fifth month as preferable for the bone operation; two months after union of the bones for the lip operation; and sixteen to twenty-two months as the proper age for the closure of the cleft soft palate.

One of the newer ideas is that which emphasizes the importance of retention of the

tuberosities of the maxillae in a normal position at the time of the bone operation, in order to produce a normal resilient and flexible soft palate so that normal articulation may be established. The author proves conclusively that the spreading of the arch, due to faulty operations, with consequent shortening of the soft palate, has more to do with speech defects than does atrophy of the parts.

New designs of operations for correcting small and large postoperative defects are shown, and their importance is manifest when it is known that at least from 20 to 40 per cent of the author's practice is the correction of badly operated cases.

The chapter devoted to the correction of atresia of the palate establishes a technic which restores normality without destruction of important structures or mutilation.

Comparative statistics on mortality reveal the importance of preoperative care in all types of cleft lip and palate surgery, and the chapter devoted to infant feeding assumes prominence. A roentgenogram of the thymus, a determination of the blood-clotting time, and a complete physical examination are routine measures advocated.

Charts showing speech zones and the text explaining the correction of speech defects are valuable contributions in postoperative care.

The bibliography covers all the work on cleft lip and palate which has been written, and affords the student references on every phase of this interesting subject.

PATENTS OF INTEREST TO DENTISTS

1408429. Sterilizer, James A. Anderson, Morgan and J. L. Anderson, Salt Lake City, Utah.

1408989. X-ray apparatus, Wm. D. Coolidge, Schenectady, N. Y.

1408582. Appliance for retaining artificial dentures or artificial teeth in place, Charles W. Gillespie, Marion, Indiana.

1408889. Dental device, John H. Kellog, Battle Creek, Michigan.

1408520. Dental instrument, Otto H. Larsen, Chicago, Ill.

1408907. Dental engine handpiece, Will R. Porter, Prince Bay, N. Y.

1408333. Mold for artificial teeth, Percy J. Pullem, Philadelphia, Pa.

1408777. X-ray angle indicator, Howard R. Raper, Albuquerque, N. Mex.

1403773. X-ray angle indicator, Howard R. Raper, Albuquerque, N. Mex.

1408960. Dental cement, Sally Schiff, Karlsruhe, Germany.

1409038. Taking dental impressions, Clinton H. Stubbins, Aspinwall, Pa.

1408559. Panoramic X-ray apparatus, Alvin F. Zulauf, Brooklyn, N. Y.

1409830. Toothbrush, George Chicken, Lodi, N. J.

1409439. X-ray machine, Charles Fayer, New York, N. Y.

1409701. Toothbrush holder, Harvey Giles, Brooklyn, N. Y.

1409226. Blowpipe, Wm. J. Leighty, Chicago, and I. Allen, Downers Grove, Ill.

1409270. Valve, Eugene W. Yearsley, Brooklyn, N. Y.

1410291. Dental flask holder, Joseph E. Gadbois, Springfield, Mass.

1410311. Dental plate filling compressor, Thomas H. Howe, Darlington, Wis.

1410130. X-ray film mount, Archibald N. Sinclair, Honolulu, Hawaii.

1411074. Adjustable casting for therapeutic application of light, Fritz A. Anderson, Milton, Wisconsin.

1411156. Dental impression tray, Bowen K. Bowen, Nashville, Tenn.

1411681. Dentrificial tablet, Gilderoy O. Burlew, Newark, N. J.

1411422. Lachrymatory gas, Herbert H. Dew, Midland, Mich.

1411713. Dental tool sharpener, Robert H. Downing, St. Louis Park, Minn.

1411505. Dental impression cup, Joseph K. Northwood, Washington, D. C.

1412268. Means for adjusting and securing artificial crowns and teeth in their operative position, Josiah S. Bridges, Wilmette, Ill.

1412130. Dental scaler, Thomas W. Onderdonk, New York, N. Y.

1412224. Dental clasp, Reginald V. Williams, Buffalo, N. Y.

1412843. Dental flask clamp and press, Walter J. Clark and W. M. Romine, Wichita, Kansas.

1412866. Anesthetizing machine, Jay A. Heidbrink and B. J. Clark, Minneapolis, Minn.

1412975. Syringe, Frederick W. Stanton, Chicago, Ill.

1412976. Syringe, Frederick W. Stanton, Chicago, Ill.

1413071. Dental rubber, Torrence A. Swartz, Huguenot Park, N. Y., and Edgar F. Ottmyer, Prince Bay, N. Y.

1413703. Closure for hypodermic solution, Joseph F. Biehn, Chicago, Ill.

1413847. Dental connection, Henry J. Friedman, Cleveland Heights, Ohio.

1414721. Appointment file or rack, Zemach Auerbach, New York, N. Y.

1414720. Appointment rack or card, Zemach Auerbach, New York, N. Y.

1414566. Dental flask, Joseph A. and D. S. Gardner, Memphis, Tenn.

1414645. Toothbrush, Phillip Iroff, Brooklyn, New York.

1414647. Tooth cervical clamp, James W. Ivory, Philadelphia, Pa.

1414475. Artificial tooth, Edward J. Kochmit, Cleveland, Ohio.

1414886. Toothbrush, Harry Matsunaga, San Francisco, Calif.

1414658. X-ray stand, William Meyer, Chicago, Illinois.

1414789. Annealing device, Clarence E. Pyle, Philadelphia, Pa.

1414604. Sanitary tooth cleaner, Rudolf Thum, Baldwin, N. Y.

1415760. Toothbrush, Louis H. Alles, Wilmington, Del.

1415765. Dental floss holder, Theodore A. Bailey, Orlando, Fla.

1415347. Mouth prop, Jay A. Heibrink, Minneapolis, Minn.

1415413. Container applicator, Richard Slee, Swiftwater, Pa.

1416614. Syringe with progressively graduated automatic action, Jules Gourand, Paris, France.

1416629. Eccentric hinge for molding flasks, John Fisher, Los Angeles, Calif.

1416630. Hinge for molding flasks, John Fisher, Los Angeles, Calif.

1416349. Molding flask, Edward C. Hafer, Chambersburg, Pa.

1416558. Filling anchor for teeth and applying same, Gustav Holtz, Gouldsboro, Pa.

1416666. Mouth wash, Emanuel London, New York, N. Y.

1416305. Mechanism for preparing molds for dental castings, Elling I. Rosheim, Roland, Iowa.

1415898. Toothbrush, Benjamin H. Rost, New York, N. Y.

1416241. Chip blower for dentists, Leo Sobol, and G. M. Marr, Brooklyn, N. Y.

1416785. Case for clinical thermometers, Joseph T. Burden, London, England.

1417236. Dental instrument, George Evans, New York, N. Y.

1417237. Dental instrument, George Evans, New York, N. Y.

1417376. Artificial tooth, Samuel L. Greenberg, New York, N. Y.

1417379. Method and means for treating and filling tooth cavities and nerve canals, Arthur L. Harvin, Washington, D. C.

1417182. Sterilizing apparatus, Francis H. Landrum and A. N. Cramer, Columbus, Ohio.

1417091. Liquid dam preparation, Edward C. Miller, Williamsport, Pa.

1417407. Toothbrush, Joseph Novak, Chicago, Illinois.

1417345. Denture and application, Alfredo Pimienta, New York, N. Y.

1417365. Thermometer case, Charles R. Wallendorf, Brooklyn, N. Y.

1417879. Dental clasp, Hugo Adere, East Orange, N. J.

1418139. Appliance for regulating the hardness of Roentgen ray tubes, Hjalmar F. Eiken, Skorping, Denmark.

1418245. Blowpipe, Edmond Fouche, Paris, France.

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